NRRI Collection of Miscellaneous Reports

Pt. 3

Natural Resources Research
Institute University of Minnesota
5013 Miller Trunk Highway
Duluth, MN 55811-1442

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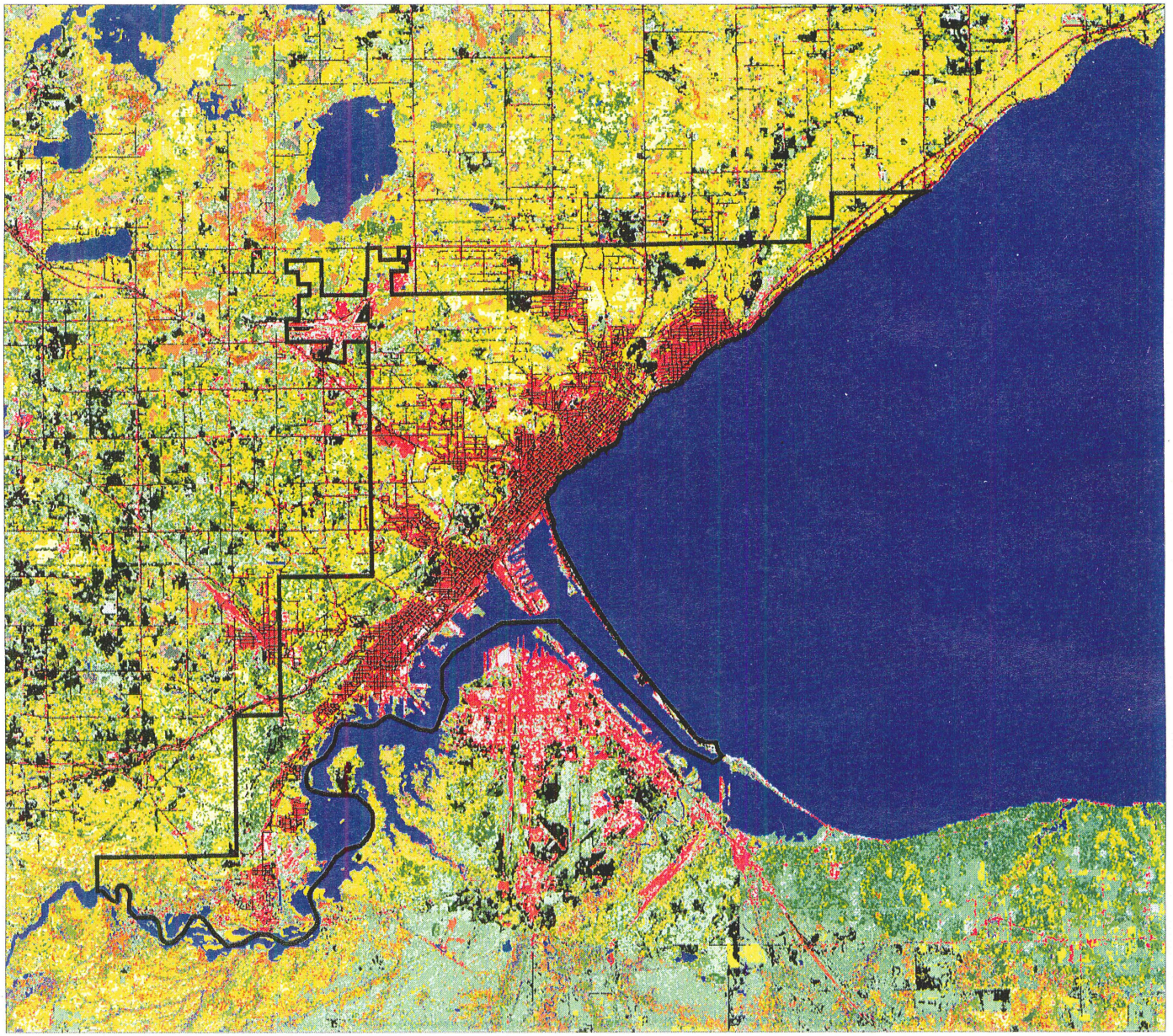
Landsat TM Forest Classification for Northeastern Minnesota



Municipal Boundaries
- Duluth

Land Cover
- Agriculture
- Sphagnum spp.
- acid bog conifer, stagnant
- aspen-birch
- aspen-birch - conifer
- aspen-birch - conifer under.
- bare ground
- bare, upland
- black ash
- black ash - conifer
- black ash - conifer under.
- black spruce
- brush, alder
- brush, alder (lowland)
- brush, ericacious
- brush, misc.
- brush, misc. (lowland)
- brush, willow
- brush, willow (lowland)
- burned
- cedar
- cedar - hardwood
- conifer, misc. (low density)
- conifer, regeneration
- developed
- emergent
- emergent, aquatic
- flooded
- grass, cool season
- grass, domestic
- grass, native
- grass, native (lowland)
- hardwood, regeneration
- hardwood, transitional
- hardwoods, misc. (lowland)
- hwd regen, low
- jack pine
- jack pine - hardwood
- jack pine - oak
- northern hardwoods
- northern hardwoods - conifer
- northern hwd, con. under.
- oak - pine
- pin oak
- red oak
- red pine
- red pine - hardwood
- roads
- spruce-fir
- spruce-fir - hardwood
- tamarack
- water
- No Data

N W E S

5 0 5 10 Kilometers

Metadata for the

Landsat TM Forest Classification for Northeastern Minnesota

Developed by

Peter T. Wolter

These metadata were created using the Minnesota Geographic Metadata Guidelines .

Go to Section:
1. Identification Information
2. Data Quality Information
3. Spatial Data Organization Information
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5. Entity and Attribute Information
6. Distribution Information
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Section 1 Identification Information

Originator Peter T. Wolter

Title Landsat TM Forest Classification for Northeastern Minnesota

Abstract

Wolter, Peter T. and David J. Mladenoff, 1995. Improved forest classification of northeastern Minnesota using Multi-temporal Landsat data and National Wetlands Inventory data. Proceedings of the 10th Annual U.S. Landscape Ecology Symposium, April 22-26, 1995.

Forest classifications using Landsat TM data have been only moderately successful in separating forest cover types in the northern Lake States region where forest cover types are notoriously heterogeneous. Forest cover types in northern Wisconsin were classified to roughly Anderson III precision with 80 percent accuracy by incorporating Landsat imagery from several key phenological dates. One criticism of the Wisconsin classification work was that the study region used was not fully representative of what is considered classic northern Lake States cover type heterogeneity (i.e., northeastern Minnesota). In this study we developed a more specific forest cover type classification for northeastern Minnesota using Landsat TM data from early summer in conjunction with key ancilliary MSS and TM dates to capture phenological changes of different tree species. In addition to satellite data, National Wetlands Inventory data were used to post-classify cover types that were initially confused in terms of spectral reflectance but were known to be associated with different soil moisture regines. Of greatest significance, aspen-birch, maple, black ash, and tamarack were sucessfully classified. This approach may be useful for broad-scale forest monitoring in other areas, particularly where ancilliary data layers are available.

Purpose	Developed for the Forest Bird Monitoring Initiative funded by LCMR and the USDA Forest Service.
Time Period of Content Date	
Currentness Reference	Date of the base TM scene for the: Chippewa National Forest region 8/6/1990 western Superior NF region 7/31/1990 eastern Superior NF region 7/2/1988 Mille Lacs - St. Croix region 6/5/1987
Progress	Complete
Maintenance and Update Frequency	As needed
Spatial Extent of Data	Landsat World-wide Reference System (WRS) coordinates 28/27, 27/27, 26/27, 27/28 in the same order listed for the dates
Bounding Coordinates	-95.60 -89.67 48.62 45.07
Place Keywords	Duluth, Minnesota is approximately the geographic center of these data.
Theme Keywords	Dominant species forest cover classification for northeast Minnesota.
Theme Keyword Thesaurus	Landsat TM
Access Constraints	
Use Constraints	Use of these data is restricted to the purchaser; the data may not be distributed third party entities. Any use or analysis of these data resulting in publication, technical reports or maps must give credit to Peter T. Wolter, David J. Mladenoff, Gerald Niemi and the Natural Resources Research Institute GIS Lab, UMD. Credits should also include the funding source: This landuse/landcover map was funded with dollars appropriated by the Minnesota State Legislature from the Environmental Trust Fund as recommended by the Legislative Commission on Minnesota Resources.
Contact Person Information	Peter T. Wolter, Research Fellow Natural Resources Research Institute, University of Minnesota - Duluth 5013 Miller Trunk Highway Duluth, Minnesota 55811 Phone: 218 720 4275 FAX: 218 720 4219 E-mail: pwolter@sparkie.nrri.umn.edu
Browse Graphic File Name	none available
Browse Graphic File Description	none
Associated Data Sets	none

Section 2 Data Quality Information - - - - - - Go back to top

Attribute Accuracy

Overall classification accuracy ranges from 72 to 75 while individual forest class accuracies range from approximately 65 to 95 percent. These data were validated using the Minnesota DNR's Phase II forest inventory data (CSA).

Logical Consistency

The 'conifer, low density' attribute is a confusion class from the eastern Superior National Forest region (WRS 26/27). Atmospheric problems captured by the 7-2-88 Landsat TM scene precluded confident separation of sparse conifers --largely jack pine-- that were associated with bare to brushy matrix ground cover. Therefore, these covertypes were put into their own class.

Completeness

jack pine = dominated by jack pine
jack pine - hardwood = jack pine with hardwood associate in overstory
jack pine - oak = jack pine with a pin oak associate
red pine = dominated by red pine
red pine - hardwood = red pine with hardwood associate in overstory
spruce/fir = balsam fir and white spruce occuring singlely or in mixture
spruce/fir - hardwood = spruce/fir with hardwood associate in overstory
cedar = dominated by northern white-cedar
cedar - hardwood = N. white-cedar with hardwood associate in overstory
tamarack = dominated by eastern larch -- tamarack
black spruce = dominated by black spruce
acid bog conifer = stagnant black spruce, tamarack or N. white-cedar
conifers, low density = sparse conifer associated with grass and brush
conifer, regeneration = primarily regenerating red pine or jack pine
black ash = dominated by black ash
black ash - conifer = black ash with conifer associate in overstory
black ash - conifer under = black ash with understory conifer associate
hardwoods, misc. lowland = undifferentiated lowland hardwoods
aspen/birch = dominated by aspen or birch singlely or in mixture
aspen/birch - conifer = aspen/birch with conifer associate in overstory
aspen/birch - conifer under = aspen/birch with conifer in the understory
northern hardwoods = dominated by Acer spp.
N. hardwoods - conifer = N. hardwoods with conifer in overstory
N. hardwoods - conifer under = N. Hardwoods with conifer in understory
red oak = dominated by red oak
oak - pine = pin oak and red oak with a conifer associate
hardwoods, transitional = sparse hardwood with brush/grass associations
hardwood regeneration = regenerating hardwood < approx. 5 years old
bare = bare soil or rock outcrop
water = rivers, lakes, ponds and reservoirs
aquatic emergent = Scirpus spp., Nuphar spp, wild rice, etc.
emergent = Typha spp., Carex spp., etc.
Sphagnum = Sphagnum spp.
grass, native = native upland graminoids
grass, native (lowland) = native lowland graminoids
grass, cool season = native graminoids that have greened up by mid-May
grass, domestic = agriculture or domestic herbaceous vegetation
brush, alder = mesic brush dominated by alder
brush, alder (lowland) = wetland brush dominated by Alnus spp.
brush, willow = mesic brush dominated by Salix spp.
brush, willow (lowland) = lowland brush dominated by Salix spp.
brush, misc. = Corylous spp., Cornus spp., Alnus spp., Salix spp., etc.
brush, misc. (lowland) = primarily Alnus spp. and Salix spp.
brush, ericacious = bog rosemary, labrador tea, leather leaf, etc.

	developed = commercial, residential, recreational or industrial roads = paved and unpaved roads; augmented using TIGER DLG data.
Horizontal Positional Accuracy	RMS error < 0.5 pixels (14.25 meters) using a second order polynomial transformation. USGS 7.5 minute topographic quadrangle maps were used as the reference for the transformation.
Vertical Positional Accuracy	none
Lineage	For an overview of the basic techniques used to classify this region see: Wolter, P.T., D.J. Mladenoff, G.E. Host and T.C. Crow, 1995. Improved forest classification in the northern Lake States using multi-temporal Landsat imagery, Photogrammetric Engineering & Remote Sensing, 61(9):1129-1143. Data used: Chippewa footprint (WRS 28/27); TM 8-6-90 MSS 5-13-88, 9-26-85, 8-9-90 Superior footprint (WRS 26/27); TM 7-2-88, 3-6-84 MSS 5-26-86, 9-26-90 Iron Range footprint (WRS 27/27); TM 7-31-90, 5-12-90, 9-20-91, 2-25-92 St. Croix footprint (WRS 27/28); TM 6-5-87, 2-25-92 MSS 5-4-87, 10-14-88
Source Scale Denominator	24000

Section 3 — Spatial Data Organization Information - - - - - - Go back to top

Native Data Set Environment	These data --arrow83b.img 220megs-- were generated using ERDAS Imagine 8.3 on a SUN Sparc Station 5.
Geographic Reference for Tabular Data	
Spatial Object Type	Raster
Vendor Specific Object Types	cell
Tiling Scheme	none

Section 4 — Spatial Reference Information - - - - - - Go back to top

Horizontal Coordinate Scheme	UTM
Ellipsoid	GRS80
Horizontal Datum	NAD83
Horizontal Units	Meters
Distance Resolution	28.5
Altitude Datum	Not applicable
Altitude Units	Not applicable
Depth Datum	Not applicable
Depth Units	Not applicable
Cell Width	28.5
Cell Height	28.5
UTM Zone Number	15

Section 5 Entity and Attribute Information - - - - - - Go back to top

Entity and Attribute Overview

These vegetation cover type data for northeastern Minnesota were derived from Landsat TM and MSS data sources. Information regarding forest cover is based on the dominant species or dominant association (e.g., northern hardwoods, spruce-fir or aspen-birch). No tree density, volumn or specific age class information is contained within these data.

Entity and Attribute Detailed Citation

Section 6 Distribution Information - - - - - - Go back to top

Publisher Peter T. Wolter, Natural Resources Research Institute - UMD

Publication Date Periodically revised

Online Linkage

Contact Person Information ,

,
Phone:
FAX:
E-mail:

Distributor's Data Set Identifier

Distribution Liability

Transfer Format Name

Transfer Format Version Number

Transfer Size

Ordering Instructions

Section 7 Metadata Reference Information - - - - - - Go back to top

Metadata Date

Contact Person Information

,

,
Phone:
FAX:
E-mail:

Metadata Standard Name

Metadata Standard Version

Metadata Standard Online Linkage

This page last updated .

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Forest Inv't

Boulevard total trees by species

1977

JANUARY 26, 1977

TOTAL TREES BY SPECIES CITY WIDE

Elm	7886	42.82%
Silver Maple	3875	21.04%
Ash	2172	11.79%
Sugar Maple	1559	8.46%
Undesirable	1241	6.73%
Basswood	731	3.96%
Evergreen	499	2.71%
Hackberry	185	1.00%
Oak, Red	77	.43%
Norway Maple	68	.37%
Ironwood	23	.13%
Red Maple	21	.11%
Summit green ash	83	.45%
TOTAL	18,420	100.00%

TOTAL TREES BY SPECIES ZONE I

Species		% Zone	% City Wide
Elm	1739	47.47	22.05
Ash	794	21.67	36.56
Silver Maple	441	12.07	11.38
Undesirable	247	6.74	19.90
Basswood	212	5.79	29.00
Sugar Maple	121	3.29	7.76
Evergreen	93	2.54	18.64
Oak	10	.27	12.99
Norway Maple	3	.08	4.41
Hackberry	3	.08	1.62
TOTAL	3663	100.00%	

This zone has 19.89% of City Trees

TOTAL TREES BY SPECIES ZONE II

SPECIES		% ZONE	% CITY WIDE
Elm	1265	33.55	16.04
Silver Maple	912	24.19	23.54
Ash	665	17.64	30.62
Undesirable	285	7.56	22.97
Sugar Maple	221	5.86	14.18
Basswood	205	5.44	28.04
Hackberry	75	1.99	40.54
Evergreen	38	1.00	7.62
Oak	13	.35	16.88
Norway Maple	8	.22	11.77
Summit Green Ash	83	2.20	100.00
TOTAL	3770	100.00%	

This zone has 20.47% of City Trees

TOTAL TREES BY SPECIES 3

Species		% Zone	% City Wide
Elm	1152	30.90	14.61
Silver Maple	928	24.89	23.95
Sugar Maple	663	17.79	42.53
Ash	309	8.29	14.23
Undesirable	248	6.65	19.98
Evergreen	226	6.06	45.29
Basswood	145	3.89	19.84
Oak	39	1.05	50.65
Norway Maple	7	.18	10.29
Hackberry	11	.30	5.95
TOTAL	3728	100.00%	

This zone has 20.24% of City Trees

TOTAL TREES BY SPECIES ZONE IV

Species		% Zone	% City Wide
Elm	1924	52.77	24.40
Silver Maple	1066	29.24	27.51
Sugar Maple	272	7.46	17.45
Basswood	121	3.32	16.55
Undesirable	81	2.22	6.53
Ash	97	2.66	4.47
Evergreen	45	1.23	9.02
Norway Maple	29	.79	42.65
Oak	10	.28	12.99
Hackberry	1	.03	.54
TOTAL	3646	100.00%	This zone has 19.79% of Cit's Trees

TOTAL TREES BY SPECIES ZONE V

Species		% Zone	% City Wide
Elm	1806	49.99	22.90
Silver Maple	528	14.61	13.63
Undesirable	380	10.52	30.62
Ash	307	8.50	14.13
Sugar Maple	282	7.80	18.09
Evergreen	97	2.69	19.44
Hackberry	95	2.63	51.35
Basswood	48	1.33	6.57
Norway Maple	21	.58	30.88
Ironwood	23	.63	100.00
Red Maple	21	.58	100.00
Oak	5	.14	6.50
TOTAL	3613	100.00%	This zone has 19.62% of City's Trees.

Total Trees by Species Zone 1 (GREEN)

	number	% of total trees this zone	% of City total that species
Elm	1745	(47.5%)	(22.1%)
Ash	797	(21.7%)	(34.8%)
Silver Maple	447	(12.1%)	(11.4%)
Undesirable	251	(6.6%)	(21.5%)
Basswood	212	(5.8%)	(29.4%)
Sugar Maple	121	(3.3%)	(7.9%)
Evergreen	93	(2.5%)	(20.3%)
Oak	10	(.3%)	(12.5%)
Norway Maple	3	(.1%)	(4.7%)
Hackberry	2	(.1%)	(1.8%)
Total	3681	(100.0%)	

Boulevard total trees by species 1980

total 18,271

1980

Total Trees by Species Zone 2 (BROWN)

	number	% of Total trees this zone	% of City total this species
Elm	1295	(34.4%)	(16.4%)
Silver Maple	928	(24.6%)	(23.8%)
Ash	726	(19.2%)	(31.7%)
Undesirable	277	(7.3%)	(23.8%)
Sugar Maple	217	(5.7%)	(14.2%)
Basswood	207	(5.6%)	(28.8%)
Hackberry	77	(2.0%)	(70.6%)
Evergreen	25	(.7%)	(5.5%)
Oak	13	(.3%)	(16.2%)
Norway Maple	7	(.2%)	(10.9%)
Total	3772	(100.0%)	

Total Trees by Species Zone 3 (RED)

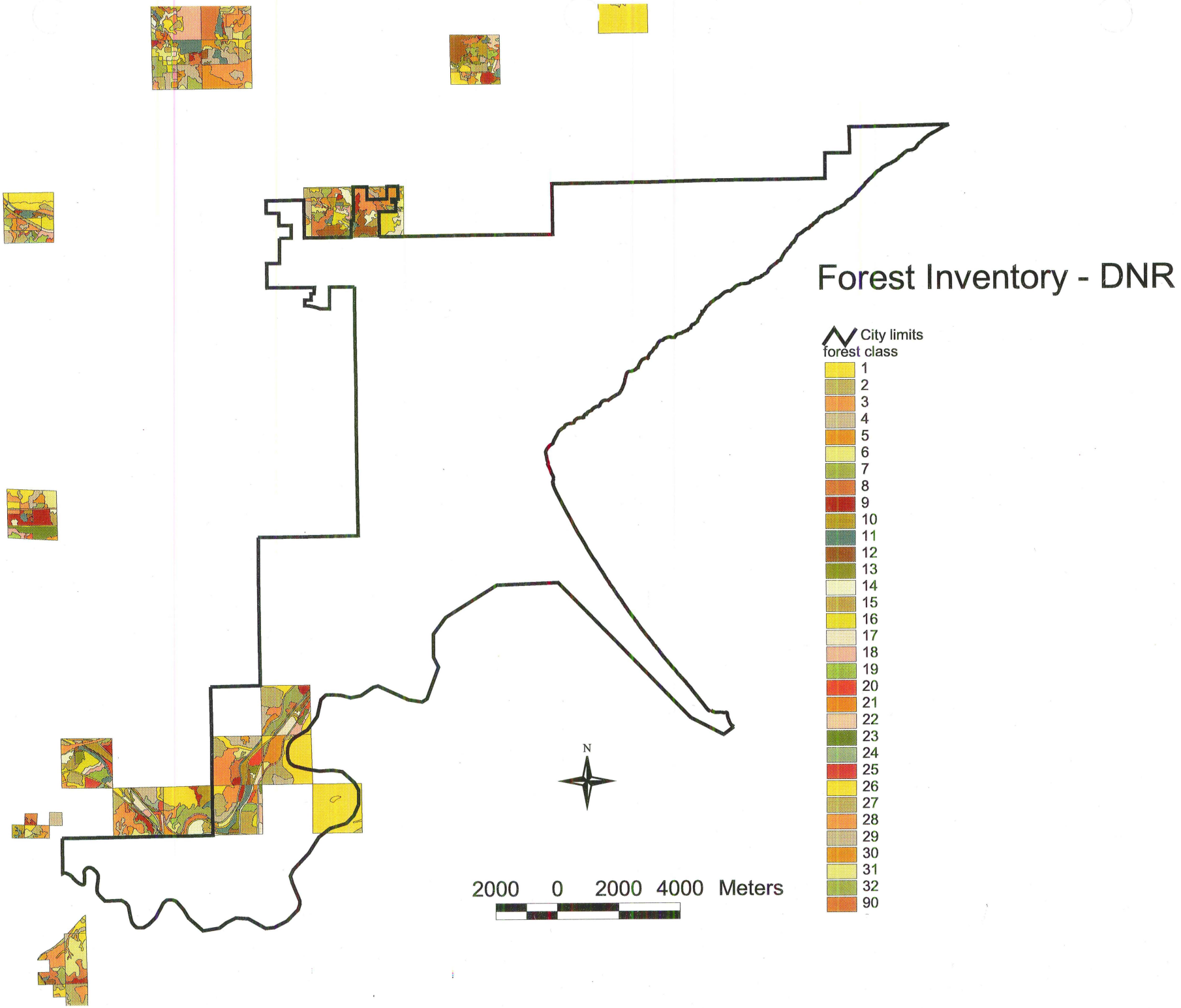
	number	% of total trees this zone	% of City total this species
Elm	1133	(31.1%)	(14.3%)
Silver Maple	932	(25.6%)	(23.9%)
Sugar Maple	637	(17.5%)	(41.8%)
Ash	305	(8.4%)	(13.3%)
Undesirable	229	(6.3%)	(19.6%)
Evergreen	219	(6.0%)	(47.8%)
Basswood	140	(3.8%)	(19.4%)
Oak	36	(1.0%)	(45.0%)
Norway Maple	8	(.2%)	(12.5%)
Hackberry	4	(.1%)	(3.7%)
Total	3643	(100.0%)	

Total Trees by Species Zone 4 (PURPLE)

	number	% of total trees this zone	% of City total this species
Elm	1955	53.3%	(24.7%)
Silver Maple	1100	(29.8%)	(28.2%)
Sugar Maple	269	(7.3%	(17.7%)
Basswood	115	(3.1%	(16.0%
Undesirable	84	(2.2%)	(7.2%
Ash	77	(2.0%)	3.4%
Evergreen	40	(1.1%)	(8.7%
Norway Maple		(.7%)	40.6%
Oak	16	(.4%)	20.0%
Hackberry		(.1%)	5.5%
Total	3688	(100.0%)	

Total Trees by Species Zone 5 (True)

	number	% of total trees this zone	% of City total this species
Elm	1783	(51.2%)	(22.5%)
Silver Maple	494	(14.2%)	(12.7%)
Ash	386	(11.1%)	(16.8%)
Undesirable	325	(9.3%)	(27.9%)
Sugar Maple	281	(8.0%)	(18.4%)
Evergreen	81	(2.3%)	(17.7%)
Basswood	46	(1.3%)	(6.4%)
Ironwood	25	(.7%)	(100%)
Red Maple	21	(.6%)	(100%)
Norway Maple	20	(.6%)	(31.3%)
Hackberry	20	(.6%)	(18.4%)
Oak	5	(.1%)	(6.3%)
Total	3487	(100.0%)	


Forest Inventory - DNR
City limits
forest class
1
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2000 0 2000 4000 Meters

- Lite Metadata - - Get Data - - View Attribute Table - - View Sample -

Minnesota DNR - Division of Forestry

Forest Inventory

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metadata created using Minnesota Geographic Metadata Guidelines .

Go to Section:
1. Identification Information
2. Data Quality Information
3. Spatial Data Organization Information
4. Spatial Reference Information
5. Entity and Attribute Information
6. Distribution Information
7. Metadata Reference Information

Section 1	*Identification Information - - - - - - top*
Originator	Minnesota DNR - Division of Forestry
Title	Forest Inventory
System Name	csaxxpy3
Abstract	Digital forest inventory (Cooperative Stand Assessment--CSA) data describing individual forest stands on a township by township basis. Updated annually. Most stands are field checked and their characteristics described. Follows internal DNR classification schema. Primary attribute storage for the Core Database version is on the coverage Polygon Attribute Table.
Purpose	Forest Resource Planning, harvest plans, treatment plans, wildlife habitat assessment, biotic community mapping support, historical vegetation studies
Time Period of Content Date	1995
Currentness Reference	Individual regions have the option of updating their forest stand information once per year. On these occasions, selected stand attributes are updated and the action is noted in a separate log which exists apart from the coverage. In this sense, the data is considered current although some stands may not have been updated for several years.
Progress	Complete
Maintenance and Update Frequency	Yearly
Spatial Extent of Data	All DNR state lands managed by Forestry Division, predominantly in the northeastern and north-central areas of the state. Lands not administered by the state are usually not included in the inventory, although many county and municipal foresters use DNR mapping techniques.
Bounding Coordinates	E = -89 W = -97.5 N = 49.5

	S = 43
Place Keywords	Minnesota
Theme Keywords	Forest
Theme Keyword Thesaurus	None
Access Constraints	None
Use Constraints	None
Contact Person Information	Bud Kincaid, GIS Specialist DNR-FORESTRY 500 Lafayette Road St. Paul, MN 55155 Phone: (651) 297-2145 FAX: E-mail: bud.kincaid@DNR.state.mn.us
Browse Graphic File Name	csaxxpy3_sam.gif
Browse Graphic File Description	
Associated Data Sets	The Forest Inclusionary Elements layer provides information on important stands falling below the minimum mapping resolution of this layer. The inclusionary element layer is being phased out, and is not included in the Core Database.

Section 2	*Data Quality Information - - - - - - top*
Attribute Accuracy	Unknown
Logical Consistency	Some non-data polygons are unlabeled. These are usually PLS section delineations within which no stands have been mapped.
Completeness	Data are complete as far as DNR adminstered lands are concerned (approximately 5 million acres), although users seeking a continuous inventory across the landscape will be disappointed, since the data is spatially fragmented.
Horizontal Positional Accuracy	Unknown
Vertical Positional Accuracy	Not Applicable
Lineage	Data are collected through a well-defined process of stand delineation on mylar over 9 by 9 inch aerial photographs. Aerial photographs are prepped with section corners for registration purposes. Vegetative cover is interpreted from the photographs prior to commencement of field work. After completion of fieldwork, delineations are adjusted accordingly to match stable basemaps. Most attribute data are also collected in the field, using standard forms that are used in subsequent tablular data entry tasks. Some work with field data recorders has been performed. Delineations are later combined into a single master source manuscript, and digitized and processed into ARC/INFO coverages. Data entry work is contracted out to BRW, Inc., which receives manuscripts and returns updated data sets by PLS township. Data are subjected to automated QC processes upon receipt at DNR Division of Forestry. Data are

	updated on approximately a three year rotation.
Source Scale Denominator	15840

Section 3	*Spatial Data Organization Information - - - - - - top*
Native Data Set Environment	ARC/INFO 5.0, 6.X
Geographic Reference for Tabular Data	Not Applicable
Spatial Object Type	vector
Vendor Specific Object Types	Polygon
Tiling Scheme	Township

Section 4	*Spatial Reference Information - - - - - - top*
Horizontal Coordinate Scheme	UTM
Ellipsoid	GRS1980
Horizontal Datum	NAD83
Horizontal Units	meters
Distance Resolution	meters
Altitude Datum	n/a
Altitude Units	n/a
Depth Datum	n/a
Depth Units	n/a
Cell Width	0
Cell Height	0
Latitude Resolution	0
Longitude Resolution	0
UTM Zone Number	15
SPCS Zone Identifier	0
County Coordinate Zone Identifier	0
Coordinate Offsets or Adjustments	n/a
Map Projection Name	n/a
Map Projection	n/a

Parameters

Other Coordinate System's Definition	n/a

Section 5	*Entity and Attribute Information - - - - - - top*
Entity and Attribute Overview	Individual forest stands attributized for Ownership, PLS Description, Unique Stand ID, Region-Area Number, State Forest Code, Other Management Unit code, Compartment ID, Acquisition status, Administrator Code, Commercial Forest Type, Cover Type Size Class, Cover Type Density, Understory Type, Understaory Density, Stand Acres, Year of Survey, Topographic Characteristics, Site Index, Physiographic Class, Average Stand Age, Basal Area/Acre, Volume/Acre in Cords in 5 to 15 DBH size class, Volume in Board Feet/Acre for trees 15 inches are larger, Condition Class, Timber Management Status, Main Species Code, Average Diameter at Breast Height, Adjusted Volume in Board Feet/Acre, Damage Conditions, Percentage of Main Species affected by Damage, Percentage of Main Species that are Dead, Primary Shrub Types, Distribution of Shrub Species, Density of Shrubs, Amount of Browse Available to Deer, Ground Cover Type, Extent of Field Chaecking, Stand Origin, Distance to Road, Unusal Feature Affecting the Management of a Site. All data elements are fully described in: FOREST SURVEY MANUAL, PHASE II - INTENSIVE INVENTORY, DNR Forest Inventory Office, Grand Rapids, 218-327-4449.
Entity and Attribute Detailed Citation	

HTML Table

Section 6	*Distribution Information - - - - - - top*
Publisher	Minnesota DNR - MIS Bureau
Publication Date	6/1/1992
Contact Person Information	Robert Maki, GIS Database Coordinator Minnesota DNR 500 Lafayette Road, Box 11 St. Paul, MN 55155 Phone: (651) 297-2329 FAX: (651) 297-4946 E-mail: robert.maki@dnr.state.mn.us
Distributor's Data Set Identifier	csaxxpy3
Distribution Liability	None stated
Transfer Format Name	7.1.2
Transfer Format Version Number	ARC/INFO
Transfer Size	700
Ordering Instructions	Contact above Person

Online Linkage	DNR Data Deli
Section 7	*Metadata Reference Information - - - - - - top*
Metadata Date	3/29/1999
Contact Person Information	Robert Maki, GIS Database Coordinator Minnesota DNR - MIS Bureau 500 Lafayette Road Saint Paul, MN 55155 Phone: (651) 297-2329 FAX: (651) 297-4946 E-mail: robert.maki@dnr.state.mn.us
Metadata Standard Name	Minnesota Geographic Metadata Guidelines
Metadata Standard Version	1.1
Metadata Standard Online Linkage	http://www.lmic.state.mn.us/gc/stds/metadata.htm

Forest Inventory (CSA)

Table Name	Field Name	Begin Column	Definition	Valid Values	Description
Forest.pat					ARC/INFO Polygon Attribute Table.
	OWNER	1	1, 1, I		Broad ownership category
				0-9	Ownership categories
	SECTION	2	2, 2, I		PLS Section within which the area feature is located.
				1-36	Standard PLS section domain.
	TYPE#	4	2, 2, I		A forest stand number that is unique within each section. The combination of Ownership, PLS section, and TYPE# comprises the redefined item "CODE" which is the relate item to the Forest.pat table.
	TOWNSHIP	6	3, 3, I		PLS township (tier) within which the area feature is located.
				26-71,101-168	Values 26-71 are located east of the state central meridian boundary. Values 101-168 are located west of the state central meridian boundary.
	RANGE	9	2, 2, I		PLS range within which the area feature is located.
				1-51	Values of 1-7 exist both east and west of the fourth principal meridian and are distinguished by values in the E/W

item. All other values are unique.					
	E/W	11	1, 1, I		Used to differentiate position relative to the fourth principle meridian.
				8	East of 4th meridian
				9	West of 4th meridian
	COUNTY	12	2, 2, I		Two digit integer county code (conforms to state standard)
				1-87	Unique county codes
	RAD#	14	3, 3, I		Division of Forestry Area Number within which the area feature is
located. The first number in this composite field indicates region, while the second and third					
numbers are area office identifiers.					

111	Bemidji
116	Bagley
117	Blackduck
121	Warroad
123	Wannaska
131	Baudette
161	Park Rapids
162	Alexandria
163	Detroit Lakes
221	Deer River
222	Effie
231	Old Hibbing
234	Hibbing
241	Orr
245	Tower
251	Cloquet
253	Two Harbors
255	Grand Marais
261	Littlefork

				311	Brainerd
				312	Little Falls
				321	Backus
				323	Pequot Lakes
				331	Hill City
				334	Aitkin
				342	Moose Lake
				344	Hinckley
				351	Cambridge
				353	St. Cloud
				442	Mankato
				443	New Ulm
				444	Willmar
				531	Lewiston
				532	Caledonia
				533	Preston
				534	Lake City
				541	Rochester
				542	Mankato
				543	New Ulm
				544	Willmar
				545	Faribault
				611	North Metro
				612	East Metro
				613	West Metro
	FOREST	17	2, 2, I		State Forest code. Each of the 56 State Forests has their own unique
code. Code Descriptions below include common abbreviation.					
				0	Outside State Forest (OTHR)
				1	Admin Site
				2	Badoura (BDOR)
				3	Battleground (BTLG)
				4	Bear Island (BEAR)
				5	Beltrami Island (BLIS)
				6	Bigfork (BIGF)
				7	Birch Lake (BIRL)

8	Blackduck (BLDK)
9	Bowstring (BOWS)
10	Buena Vista (BU.V)
11	Burntside (BURN)
12	Chengwatana (CHWA)
13	Cloquet Valley (CLOQ)
14	Crow Wing (CROW)
15	D.A.R. (DAR.)
16	Emily (EMLY)
17	Finland (FINL)
18	Fond Du Lac (FDUL)
19	Foot Hills (FHIL)
20	General C.C. Andrews (GENA)
21	George Washington (GWAS)
22	Golden Anniversary (GOLD)
23	Grand Portage (GRPO)
24	Hill River (HILR)
25	Huntersville (HUNT)
26	Insula Lake (INSL)
27	Kabetogama (KABT)
28	Koochiching (KOOC)
29	Lake Isabella (ISAB)
30	Lake Jeanette (LJNE)
31	Land O'Lakes (LOLO)
32	Lyons (LYON)
33	Minn. Mem. Hardwood (MHWD)
34	Mississippi Hdwtrs. (MHWT)
35	Nemadji (NMDJ)

				36	Northwest Angle (NWAN)
				37	Pat Bayle (BAYL)
				38	Paul Bunyan (PAUL)
				39	Pillsbury (PILL)
				40	Pine Island (P.IS)
				41	Red Lake (REDL)
				42	Remer (REMR)
				43	Rum River (RUMR)
				44	St.Croix (ST.C)
				45	Sand Dunes (SAND)
				46	Savanna (SAVA)
				47	Smokey Bear (SMOB)
				48	Smoky Hills (SMOH)
				49	Solana (SOLA)
				50	Sturgeon River (STUR)
				51	Two Inlets (TWOI)
				52	Wealthwood (WLTH)
				53	Welsh Lake (WELS)
				54	White Earth (W.EA)
				55	Whiteface River (FACE)
				56	Snake River (SNAK)
	OTHER	19	3, 3, I		Code number of any management unit other than a State Forest
(including State Parks, County Parks, Game Management Areas, School or Municipal Forests, or					
any other unit which requires a separation of data due for management. Of these, State Parks					
have their own three digit numbering					

scheme (provided below). Other management units are	
assigned identifiers prior to the survey process.	

1	Administration
72	Acton Monument
89	Afton
86	Banning
53	Baptism River
69	Bear Head Lake
3	Beaver Creek Valley
66	Big Stone Lake
5	Birch Coulee
34	Blue Mounds
6	Brook Park Monument
7	Buffalo River
8	Camden
9	Camp Release
73	Caribou Falls
78	Carley
61	Cascade River
10	Charles A. Lindbergh
38	Chippewa Lac Qui Parle
11	Count Beltrami
74	Cross River
65	Crow Wing
75	Devil's Track
13	Father Hennepin
14	Flandrau
76	Flood Bay
87	Forestville
15	Fort Ridgely
77	Fort Snelling
2	Franz Jevne
62	Frontenac
64	George Crosby Manitou
88	Glacial Lakes

				17	Gooseberry Falls
				99	Hayes Lake
				4	Helmer Myre
				57	Hinckley Monument
				19	Inspiration Peak
				20	Interstate
				21	Itasca
				22	Jay Cooke
				23	John Latsch
				56	Joseph R. Brown
				71	Judge C.R. Magney
				25	Kilen Woods
				79	Kodonce River
				26	Lac Qui Parle
				27	Lake Bemidji
				28	Lake Bronson
				29	Lake Carlos
				90	Lake Louise
				91	Lake Maria
				30	Lake Shetek
				92	Little Elbow Lake
				100	Wild River
				101	Tettagouche
	COMP#	22	1, 1, I		Compartment identifier assigned prior to the survey of an area. This identifier is assigned on a case by case basis. If a feature is not part of a compartment, then a value of "0" will be present.
	ACQUI	23	1, 1, I		Acquisition status of the land upon which the feature is located.
				0	None of the below
				1	Trust Fund (School or swamp)
				2	Acquired Land
				3	Consolidated Conversion

			4	L.U.P. (Leased)
			5	50-50 Lands
			6	University
			7	Volstead
			8	Salt Spring
			9	Tax Forfeited
ADMIN	24	1, 1, I		Administrator Code Number for the feature
			0	None of the Below
			1	State Forestry
			2	State Fish and Wildlife
			3	State Parks and Recreation
			4	Other State Agency
			5	County
			6	Private
CTYPE	25	2, 2, I		Feature cover (Commercial Forest) type. This is where the forest type
is specified. To be a main cover type, a stand of trees must have more than three cords/acre or				
1250 board feet/acre. For a full description of the criteria for including and excluding species				
from cover type descriptions, see the Forest Survey Manual, Page 8.				
Attribute codes for commercial forest type are presented below. Common abbreviations for each				
type are provided in parentheses.				
			1	Ash (Ash). A bottomland type composed of ash
				Willow (Wil). A bottomland type

	6	which attains merchantable. size in the southern portion of the state
	9	Lowland Hardwoods (LH). Bottomland hardwoods (Ash, Elm, Balm, of Gilead, etc.)
	12	Aspen (A). Trembling or large tooth Aspen or Paper Birch; Aspen predominating
	13	Birch (Bi). Paper Birch usually with Aspen. Paper Birch predominating
	14	Balm of Gilead (BG). A type composed almost entirely of Balm of Gilead, or of Balm of Gilead and Aspen with Balm of Gilead predominating
	15	Cottonwood (Cot). Cottonwood; usually in southern portion of state
	20	Northern Hardwoods (NH). Northern or upland hardwood species (Maple, Yellow Birch, Basswood, Oaks)
	25	Walnut (WAL). Walnut
	30	Oak (O). Oak
	40	Central Hardwoods (CH). Dense hardwoods, with Oak, Hickory, Cherry, Butternut
	51	White Pine (WP). Pine with White Pine outweighing Norway and Jack Pine

				52	Norway Pine (NP). Pine with Norway Pine outweighing White and Jack Pine
				53	Jack Pine (JP). Pine with Jack Pine outweighing White and Norway Pine
				54	Scotch Pine (SCP). A type usually a plantation entirely Scotch Pine
				61	White Spruce (WS). A type with White Spruce predominating
				62	Balsam Fir (BF). A type with Balsam Fir predominating
				71	Black Spruce;Lowland (BSL). Swamp conifers with Black Spruce outweighing
other species.					
				72	Tamarack (T). Swamp conifers with Tamarack outweighing other species
				74	Black Spruce;Upland (BSU). A type usually on high rocky ridges, often in mixture
with Jack Pine					
				81	Red Cedar (RC). A type usually found on dry sites in the south half of the state,
seldom attains a large size					
	CSIZE	27	1, 1, I		Cover type size class (diameter at breast height). Values are calculated
from a table presented on Page 10 of the Forest Survey					

Manual. Comments on code descriptions relate to this table.					
				0	Not applicable for the type
				1	0 - 0.9 inches (based on stems/acre).
				2	1 - 2.9 inches (based on stems/acre).
				3	3 - 4.9 inches (based on stems/acre).
				4	5 - 8.9 inches (based on cords/acre).
				5	9 - 14.9 inches (based on cords/acre).
				6	15 - 19.9 inches (based on board feet/acre).
				7	10 -24.9 inches (based on board feet/acre).
				8	25 + inches (based on board feet/acre).
	CDENSE	28	1, 1, I		Cover type density. Code values range from 1-9, although each of
these values can have different meanings based on whether the stand is being expressed in terms of stems/acre, cords/acre, or sawtimber.					
	UTYPE	29	2, 2, I		Understory type. Code domain is identical to that stored in the CTYPE
field. If the main cover type (stored in CTYPE) is a forest type with a size class less than 5 inches DBH, is deforested, or is a non-forest type, then no understory is defined, then this					

field will contain a value of "0".					
	USIZE	31	1, 1, I		Understory size class. Code domain is identical to that stored in the CSIZE field. If the understory is a deforested, or is a non-forest type, then this field will contain a value of "0".
	UDENSE	32	1, 1, I		Understory density. Classified according to the number of stems/acre. The density table on page 10 of the Forest Survey Manual is used to assign codes in this field (code domain is the same as the seedlings and samplings category of CDENSE, which is expressed in stems/acre). If the understory is a deforested, or is a non-forest type, then this field will contain a value of "0".
	ACRES	33	3, 3, I		Acres of the stand (area feature)
	YEAR	36	2, 2, I		The last two digits of the year in which the survey was done.
	TOPO	38	1, 1, I		Topographic characteristics of the site
				0	Not applicable (lakes, etc.)
				1	Level (flat terrain such as bogs and marshes)
					Rolling (gently

				2	rolling terrain such as hills or ridges which will not seriously hamper
management efforts)					
				3	Steep (abrupt peaks, sharply dropping hills or ridges which will seriously hamper
management efforts).					
	SI	39	2, 2, I		Site Index. A measure of productivity based on tree species height and age.
				A continuous scale between 10 and 80+	Site index is determined from a set of charts
available in the Forest Survey Manual on pages 13.1-13.12.					
	PHYS	41	1, 1, I		Physiographic class (soil and water class)
				0	Not applicable (permanent water, etc.)
				1	Xeric (droughty as the result of excessive drainage; growth rate and species
occurrence is limited)					
				2	Xeromesic (Moderately dry site; excessive drainage limits growth and species
occurrence to some extent)					
				3	Mesic site (a good site; soil and water relationship favorable to tree growth with
growth and species occurrence limited					

only by climate)					
				4	Hydromesic (a wet site characterized by poor drainage or frequent flooding, which
affects species occurrence). These include bottomland hardwood sites and hardpan soils of					
coniferous forests.					
				5	Hydric (a very wet site where growth and species occurrence is seriously limited by
excess water). Examples include flooded river bottoms and spruce bogs.					
	AGE	42	3, 3, I		Average stand age in years. Age values pertain to the main cover type and
reflects the main size class of the species to be managed. Average type age is determined by					
taking core samples from representative trees.					
	BA	45	3, 3, I		Basal Area/Acre. This parameter is determined by tallying the number of
live trees 1 inch DBH and larger within the sample plot(s), dividing by the number of plots taken,					
and multiplying the result by 10. Basal area is affected by inclusionary types. Adjustments					
based on inclusions are performed using					

procedures provided on pages A-14 and A-14.1 of the Forest Survey Manual.					
	CORDS	48	2, 2, I		The cord volume/acre for all trees that are from 5 to 15 inches
diameter (DBH) to a four inch top diameter.					
	MBF	50	3, 3, I		Thousands of board feet/acre. The actual board feet volume/acre for all
trees that are 15 inches or larger diameter to a six inch and larger top diameter.					
	COND	53	1, 1, I		Condition class. The code number best representing the stand
condition, considering species, age, size, quality, and stocking.					
				0	Non-stocked (except regeneration and cutover). Includes those lands which have not
supported timber in the recent past.					
				1	High risk. Those stands which will not survive or will have substantial volume loss.
				2	Mature. A stand at or beyond the rotation age and which does not fit the high risk
category.					
				3	Immature. A stand below rotation age and which cannot be considered high risk or

mature. Not below 10 years of age.					
				4	In the process of regeneration. Types below 10 years of age.
	TBR	54	1, 1, I		Timber management status of the type. This field essentially defines
restrictions on harvesting.					
				0	Not Applicable (not a forest type).
				1	Normal timber harvesting allowed.
				2	Restricted timber harvesting allowed. Parks, etc. where other management priorities
limit timber harvesting.					
				3	No timber harvesting allowed, due to law or policy.
				4	Statutory shoreline restriction around lakes and rivers.
				5	Old growth
				6	Old growth management zone.
	SPP	55	2, 2, I		The species code number for the main species in the cover type. For cover
types that have been classified as containing trees 5 inches DBH and larger, the main cover type					
species is considered to be the one with the highest volume of wood. Similarly, for cover types					
containing trees less than 5 inches DBH, the species with the					

greatest number stems is recorded here.

1	Ash, Black (BASH)
2	Elm, American (AELM)
3	Maple, Silver (SMAP)
4	Elm, Red (RELM)
5	Elm, Rock (ROCE)
6	Willow (WIL)
12	Aspen, Trembling (ASP)
13	Birch, Paper (PBIR)
14	Balm of Gilead (BG)
15	Cottonwood (COT)
16	Aspen, Largetooth (LASP)
17	Poplar, Hybrid (POP)
21	Maple, Red (RMAP)
22	Maple, Sugar (HMAP)
23	Basswood (BASS)
24	Birch, Yellow (YBIR)
25	Walnut (WAL)
26	Butternut (BUTT)
27	Cherry (CHER)
28	Buckeye (BUC)
31	Oak, Red (ROAK)
32	Oak, Black (BOAK)
33	Oak, Northern (POAK)
34	Oak, White (WOAK)
35	Oak, Burr (OAK)
36	Oak, Scarlet (SOAK)
38	Ash, White (WASH)
39	Ash, Green (GASH)

41	Hickory, Bitternut (BHIC)
42	Hickory, Shagbark (SHIC)
43	Hackberry (HACK)
45	Boxelder (BOXE)
51	Pine, White (WP)
52	Pine, Norway (NP)
53	Pine, Jack (JP)
54	Pine, Scotch (SCP)
55	Pine, Ponderosa (PONP)
56	Pine, Austrian (AUSP)
61	Spruce, White (WS)
62	Balsam Fir (BF)
63	Spruce, Colorado (CSPR)
64	Spruce, Norway (NSPR)
65	Spruce, Blk. Hills (BHSP)
71	Spruce, Black (BSPR)
72	Tamarack (TAM)
73	Cedar, N. White (WCED)
81	Cedar, E. Red (RCED)
82	Hemlock (HEM)
83	Douglas Fir (DFIR)
84	Larch, European (EURL)
85	Larch,Japanese (JAPL)
86	Larch, Siberian (SIBL)
91	Locust (LOC)
92	Ironwood (IWD)
93	River Birch (RIVB)
94	Blue Beech (BLUB)
99	Miscellaneous (MISC)

	DBH	57	2, 2, I	Average diameter at breast height (in inches) of the main species in the type.
	HEIGHT	59	2, 2, I	The average total height (in feet) of the tree species being recorded as the main species.
	VOLUME	61	3, 3, I	Volume of wood per acre expressed in board feet, cords, or thousand stems per acre (depending on size class distribution with breaks at 15 inches and 5 inches respectively). Adjustments have been made based on the presence of inclusionary elements.
	DAMAGE	64	2, 2, I	Types of damage present in the main species of the cover type. Problems on associated species or the understory are not recorded here. Whenever a combination of pests occur on a host, the most serious or predominant pest is reported. Code Ranges denote type of damage: 1-10,15 indicates insect damage 16-33,40 indicates disease 41-45,50 indicates

animal damage
51-57,60 indicates environmentally caused damage
61-62 indicates human damage

1	Defoliators
2	Bark Beetles
3	Wood Borers
4	Spittlebug
5	White Pine Weevil
6	Spruce Budworm
7	Jack Pine Budworm
8	Shoot Insects (regen)
9	Poplar Borer
10	Root Collar Insects
15	Insects (other)
16	White Pine Blister Rust
17	White Pine Blister Rust w/W.Pine Weevil
18	Sweet Fern Rust
19	Scleroderris Canker
20	Sirococcus Shoot Blight
21	Butternut Canker
22	Oak Mortality
23	Dwarf Mistletoe
24	Diplodia Tip Blight
25	Hypoxylon Canker
26	White Rot of Aspen (Phellinous)
27	Hypoxylon Canker in w/White Rot of Aspen
28	Heart Rot
29	Dutch Elm Disease
30	Birch Decline
31	Hardwood Cankers
32	Needle Rust
33	Shoestring Root Rot
40	Diseases (other)

			41	Beaver
			42	Porcupine
			43	Rabbit -Mice
			44	Deer (or Moose)
			45	Sapsucker
			50	Animal
%AFFECT	66	1, 1, I		Percentage of the main species in the type affected by damage.
%MORTAL	67	1, 1, I		Percentage of the main species in the type that are dead
SHRUBS	68	2, 2, I		The primary shrub species present in the cover type
			0	No shrub species present
			1	Unknown, below snow
			2	Predominantly (most common) Labrador Tea, Leatherleaf
			3	Predominantly lowland Alder
			4	Predominantly lowland Willow
			5	Predominantly Prickly Ash
			6	Predominantly Raspberry or other Rubus
			7	Alder/Willow with fair amount of Red Osier
			8	Combination of upland Blueberry and other low shrubs
			9	Predominantly Sumac
			10	Predominantly Hazel
			11	Hazel combined with (one or more) Honeysuckle, Mt. Maple, Dogwood, Juneberry,

Upland Willow

				12	Predominantly Dogwood
				13	Predominantly Mt. Maple
	DISTR	70	1, 1, I		The distribution of shrub species within the stand (this describes
"coverage," not "density").					
				0	No shrubs present
				1	Fairly uniform shrub distribution throughout the stand
				2	Scattered shrub clusters throughout the stand.
				3	Shrubs located in a single concentration, and as a partial coverage type.
	DENSE	71	1, 1, I		Density of shrubs where they occur within the stands.
				0	No shrub species present
				1	Low density cover.
				2	Moderate density cover.
				3	High density cover.
	BROWSE	72	1, 1, I		Amount of shrub browse available to deer (twigs - 3/4 inch diameter
below 7 feet).					
				0	No shrub species present
				1	Nothing (all browse out of reach)
				2	Small amount (some browse available)
				3	Moderate amount (twigs generally available)
				4	High amount (twigs are all available)
	COVER	73	1, 1, I		Ground Cover
				0	Unknown, covered with snow or water

				1	Predominantly bare ground or rock or dead litter
				2	Grasses and/or sedges with few or no forbs.
				3	Predominantly smartweed, fireweed, jewelweed, nettle, or combination.
				4	Predominantly sphagnum mosses and/or lichens
				5	Predominantly feather mosses and/or ground pine and/or lichens.
				6	Predominantly ferns and grasses.
				7	Predominantly blueberry, sweetfern, wintergreen, bearberry, and grasses or
combination.					
				8	Predominantly large leaf aster, wild sarsparilla, Clinton's lily or combination and
grasses.					
				9	Predominantly goldenrod, aster, clovers, lupine, weeds, or combination and grasses.
	RECON	74	1, 1, I		Reconnaissance level (extent of field checking)
				0	Other-none of those listed below
				1	Aerial photo interpretation only
				2	Checked from air by aircraft, helicopter, etc.
				3	Fields checked on the ground (not

					snow covered)
				4	Fields checked on the ground (1 - 6 inches of snow)
				5	Fields checked on the ground (7 - 12 inches of snow)
				6	Fields checked on the ground (12 - 24 inches of snow)
				7	Fields checked on the ground (24 - 36 inches of snow)
				8	Fields checked on the ground (36+ inches of snow)
				9	Type comparison with a like type that has been ground checked.
	ORIGIN	75	1, 1, I		Stand origin
				0	Not applicable (includes cutcover areas)
				1	Natural stand with no evidence of artificial regeneration
				2	More than 40 percent of the type occupied by trees originated from artificial stands.
				3	Less than 40 percent of the type is occupied by artificially regenerated trees.
	ROAD	76	1, 1, I		Distance to road (codes indicate the lower end of a distance range in miles). For example, a code of 2 indicates that the nearest road is between 2 and 3 miles away.
					In general, data within this field are not consistently maintained and are

considered unreliable.					
	SIGN	77	1, 1, I		Significant conditions. These are unusual features affecting the
management of a site.					
				0	None
				1	Unusual botanical features
				2	Unusual geological features
				3	Unusual historical features
				4	Unusual scenic or recreational potential
				5	Eagle or Osprey nesting site
				6	Active deer yarding area
				7	Other wildlife feature
				8	Other features
	CARDS	78	1, 1, I		Number of cards used to record data
					The remaining fields in this table repeat a single set of attributes for up to eight
sub-dominant species. The first set of these are defined below (those fields with names					
beginning with the string "S2"). Subsequent sets (beginning with S3-S9) contain the same					
attributes and are not explicitly described.					
Fields with names beginning with S2, S3, S4, and S5 are data related to subdominant tree					

species with diameter at breast height (DBH) measurements of greater than 5 inches. These are data collected on the "CARD #2" portion of the DNR forest survey data collection sheet. Fields with names beginning with S6, S7, S8, and S9 are data related to subdominant tree species with diameter at breast height (DBH) measurements of 4.9 inches or less. These are data collected on "CARD #3" of the DNR forest survey system.	S2SPP	79	2, 2, I	Species code number as described in conjunction with the SPP item (above).
	S2DBH	81	2, 2, I	Diameter at Breast Height (DBH)
	S2DST	83	1, 1, I	Species distribution (e.g. scattered throughout or clustered)
	S2VOL	84	3, 3, I	Volume of wood per acre. Same criteria as the "VOLUME" field described above.
	S2DAM	87	2, 2, I	Insect, disease, and other damage. Same criteria as the "DAMAGE" field described above.
	S2HAR	89	1, 1, I	Harvest
				The species should

			0	not be considered for harvest for the next 10 years
			1	The species should be considered for harvest for the next 10 years
S3SPP	90	2, 2, I		
S3DBH	92	2, 2, I		
S3DST	94	1, 1, I		
S3VOL	95	3, 3, I		
S3DAM	98	2, 2, I		
S3HAR	100	1, 1, I		
S4SPP	101	2, 2, I		
S4DBH	103	2, 2, I		
S4DST	105	1, 1, I		
S4VOL	106	3, 3, I		
S4DAM	109	2, 2, I		
S4HAR	111	1, 1, I		
S5SPP	112	2, 2, I		
S5DBH	114	2, 2, I		
S5DST	116	1, 1, I		
S5VOL	117	3, 3, I		
S5DAM	120	2, 2, I		
S5HAR	122	1, 1, I		
MISC.CORD	123	3, 3, I		
MISC.BF	126	3, 3, I		
S6SPP	129	2, 2, I		
S6SIZ	131	1, 1, I		
S6DEN	132	1, 1, I		
S6DST	133	1, 1, I		
S6DAM	134	2, 2, I		
S7SPP	136	2, 2, I		
S7SIZ	138	1, 1, I		
S7DEN	139	1, 1, I		
S7DST	140	1, 1, I		
S7DAM	141	2, 2, I		
S8SPP	143	2, 2, I		
S8SIZ	145	1, 1, I		
S8DEN	146	1, 1, I		
S8DST	147	1, 1, I		
S8DAM	148	2, 2, I		
S9SPP	150	2, 2, I		

	S9SIZ	152	1, 1, I	
	S9DEN	153	1, 1, I	
	S9DST	154	1, 1, I	
	S9DAM	155	2, 2, I	
	REMS	157	22, 22, C	
	OLDACRES	179	3, 3, I	
	DUMMY1	182	97, 97, C	
	CODE	1	5, 5, I	REDEFINEd on 1. This is the relate item between the DF.INVENT table and the forest.pat table. It is a foreign key to that table.
	CARD0	1	79, 79, C	REDEFINED on 1. This field redefinition does not consistently appear in the database, and should not be relied on.
	TWPRNG	6	6, 6, I	REDEFINED on 6. This field redefinition does not consistently appear in the database, and should not be relied on.
	SOMEOFIT	6	172, 172, C	REDEFINED on 6. This field redefinition does not consistently appear in the database, and should not be relied on.
	TMP	19	4, 4, I	REDEFINED on 19. This field redefinition does not consistently appear in the database, and should not be relied on.
	ACQUI_ADMIN	23	2, 2, I	REDEFINED on 23. This field redefinition does not consistently appear in the database, and should not be relied on.
				REDEFINED on 55.

	SPECIE	55	2, 2, I	This field redefinition does not consistently appear in the database, and should not be relied on.
	LSP2345	79	44, 44, C	REDEFINED on 79. This field redefinition does not consistently appear in the database, and should not be relied on.
	LSP345	90	33, 33, C	REDEFINED on 90. This field redefinition does not consistently appear in the database, and should not be relied on.
	LSP45	101	22, 22, C	REDEFINED on 101. This field redefinition does not consistently appear in the database, and should not be relied on.
	LSP5	112	11, 11, C	REDEFINED on 112. This field redefinition does not consistently appear in the database, and should not be relied on.
	MISC.VOLUMES	123	6, 6, I	REDEFINED on 123. This field redefinition does not consistently appear in the database, and should not be relied on.
	SSP1234	129	28, 28, C	REDEFINED on 129. This field redefinition does not consistently appear in the database, and should not be relied on.
	SSP234	136	21, 21, C	REDEFINED on 136. This field redefinition does not

				consistently appear in the database, and should not be relied on.
	SSP34	143	14, 14, C	REDEFINED on 143. This field redefinition does not consistently appear in the database, and should not be relied on.
	SSP4	150	7, 7, C	REDEFINED on 150. This field redefinition does not consistently appear in the database, and should not be relied on.
	SECODE1	157	1, 1, C	REDEFINED on 157. This field redefinition does not consistently appear in the database, and should not be relied on.
	SECODE2	158	1, 1, C	REDEFINED on 158. This field redefinition does not consistently appear in the database, and should not be relied on.
	RESTOFIT	179	99, 99, C	REDEFINED on 179. This field redefinition does not consistently appear in the database, and should not be relied on.
	LEGAL	182	10, 10, I	REDEFINED on 182. This field redefinition does not consistently appear in the database, and should not be relied on.
	L1	182	2, 2, I	REDEFINED on 182. This field redefinition does not consistently appear in the database, and

should not be relied on.				
	LEGAL2	182	8, 8, I	REDEFINED on 182. This field redefinition does not consistently
appear in the database, and should not be relied on.				
	L2	184	6, 6, I	REDEFINED on 184. This field redefinition does not consistently appear
in the database, and should not be relied on.				
	L3	190	2, 2, I	REDEFINED on 190. This field redefinition does not consistently appear
in the database, and should not be relied on.				
	SORT.REPORT	264	3, 3, I	REDEFINED on 264. This field redefinition does not
consistently appear in the database, and should not be relied on.				
	SP	4000	2, 2, I	REDEFINED on 4000. This field redefinition does not consistently
appear in the database, and should not be relied on.				
	SP.CTYP	4000	4, 4, I	REDEFINED on 4000. This field redefinition does not
consistently appear in the database, and should not be relied on.				
	CTYP	4002	2, 2, I	REDEFINED on 4002. This field redefinition does not consistently
appear in the database, and should not be relied on.				

	T041239-ID	1	5, 5, I	REDEFINED on 1. This field redefinition does not consistently
appear in the database, and should not be relied on.				
	FOREST2.REL	1	5, 5, I	REDEFINED on 1. This field redefinition does not consistently
appear in the database, and should not be relied on.				

WOODLAND STEWARDSHIP PLAN

DATE: June 1995

LANDOWNER: City of Duluth
Division of Forestry
208 City Hall
411 West 1st Street
Duluth, MN 55802
218/723-3586

PREPARED BY:
Jan & Greg Bernu, Consulting Foresters
Two By Forestry
Hc 67 Box 6379
Two Harbors, MN 55616
218/834-4336

This plan is designed to assist you with your natural resource stewardship activities by combining your goals and the capabilities of the ecosystem. We appreciate your interest and offer the enclosed recommendations for your consideration.

THE GOALS YOU IDENTIFIED FOR MANAGING YOUR PROPERTY ARE:

- Coordinate bird, wildlife and timber management, creating and maintaining quality bird and wildlife habitat and a healthy and diversified forest.

- Continue to provide quality recreational opportunities for the outdoor sports enthusiasts.

- Maintain this area as a conifer stand since it is a unique stand within the city of Duluth.

GENERAL PROPERTY DESCRIPTION

LANDOWNER: City of Duluth

ACRES: 55 (qualify for stewardship acres)

LEGAL: Part of SE¼ of Section 31, T51N, R13W; parts of SE¼NW¼ & SW¼ of Section 32, T51N, R13W; Lakewood part of City of Duluth Township; St. Louis County, MN. The property is located along the Skyline Parkway about 1½ miles northeast of the Glenwood/Skyline Parkway intersection.

CURRENT USES: The property is adjacent to Hawk Ridge which is a renown bird watching and tagging area. It is also adjacent to City recreational trails which are used for snowmobiling, hiking, biking, jogging, etc. Additional trails exist throughout the property.

ACCESS: There is direct access off of Skyline Parkway.

SOIL: Clay.

TOPOGRAPHY: Gently rolling to steep.

WATERSHED: Lester River & Lake Superior; Amity Creek borders the property to the north.

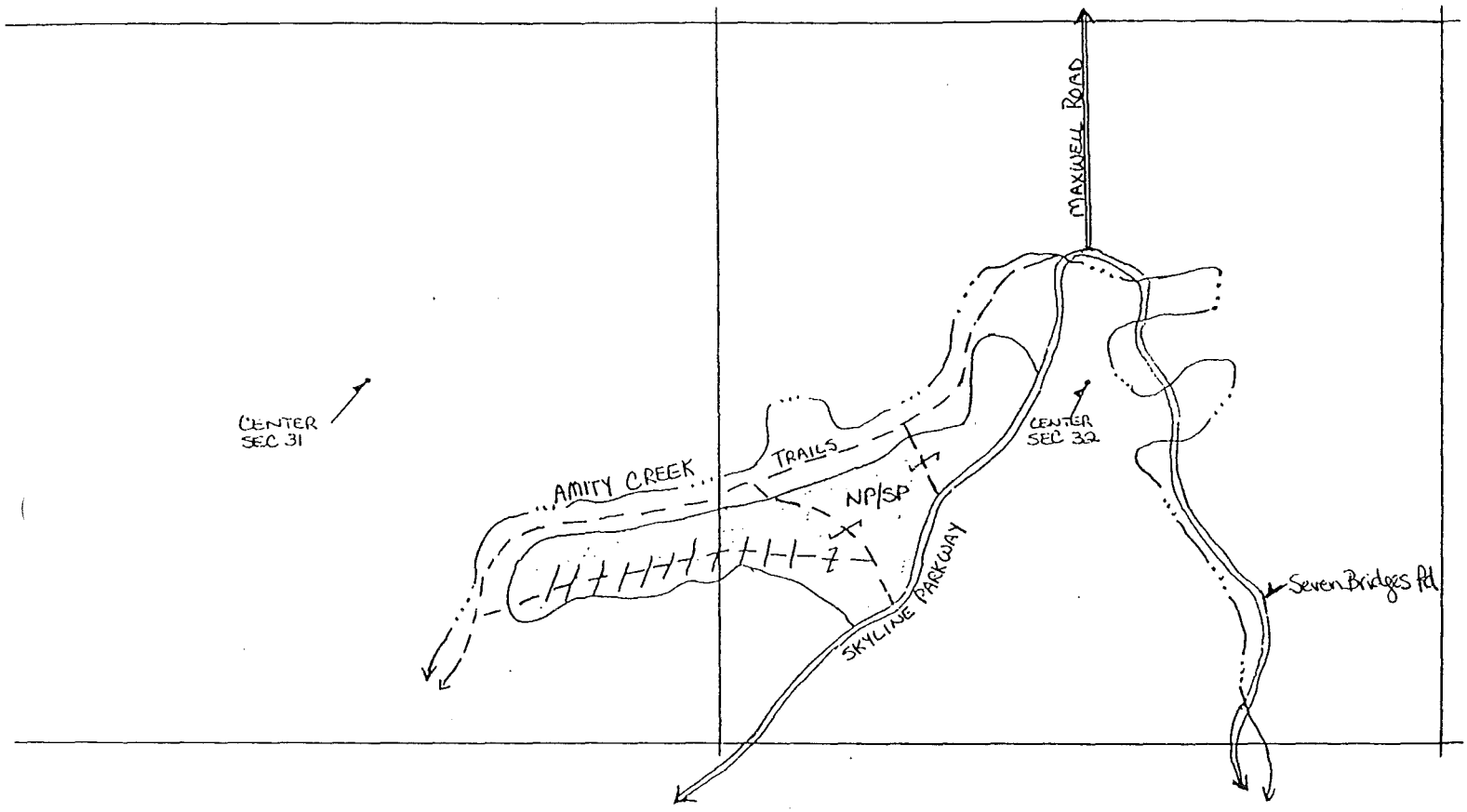
ECOREGIONS: Ecoregions are distinctive areas of the state with similar combinations of ecological and geological characteristics that set them apart from other areas.

This property is located in the Northern Coniferous Forest province and North Shore Highlands subsection of Minnesota. This ecoregion occupies the area next to Lake Superior. It is gently rolling to steep. Bedrock outcroppings are common and soils are commonly shallow. Soils are formed in red and brown glacial till and are very rocky. Lake Superior dominates this region and moderates the climate throughout the year, acting as an air conditioner in summer and a heat sink in winter. Presettlement vegetation was forested, consisting of white, red and jack pine, balsam fir, white spruce, and aspen-birch.

This area is located on red clay soil in St. Louis County. A major stewardship concern in this area is the clay soils which may cause serious erosion problems on areas which are steeply sloped and have little or no vegetation. If not carefully managed, erosion on these soils can also result in excessive sediment in nearby drainages causing problems for fish populations and water quality.

LEGAL: SECTIONS 31 & 32
T51N R13W
ST LOUIS COUNTY
MINNESOTA

SCALE: 4" = 1 MILE



NP/SP - NORWAY PINE/SCOTCH PINE PLANTATION
//// - AREA OF HIGH MORTALITY

DESCRIPTION & RECOMMENDATIONS

NORWAY (RED) & SCOTCH PINE PLANTATION
Acres: 55
Map Type Code: NP/SP

DESCRIPTION
This type is a pine plantation that was planted in 1927. The stand is comprised of Norway/Red and Scotch pine with scattered white spruce. Aspen, birch, and other scattered hardwoods and brush are encroaching in areas, especially on the edges. The northeastern portions of the stand were lightly mechanically thinned approximately 15 years ago. About 5% of the trees were removed at that time.

The condition of the stand ranges from poor to fair for the Norway pine and good for the Scotch pine. The poor condition of the stand is due to the general unsuitability of the site for pine. The clay soil causes poor drainage and wet conditions. Throughout the stand, small pockets of Norway pine have been stressed and subsequently attacked and killed by bark beetles. There is also a large pocket of dead Norway pine in the western portion of the stand.

Good natural tree regeneration is present. The regeneration species and approximate stems/acre present include the following: Scotch pine - 290; balsam fir - 225; white spruce - 130; paper birch - 130; aspen - 110; red maple - 25; green ash - 20; red oak - 5; and willow - 5. Tree heights range from 1" to 10'; the average height is 1-3'. Tree stocking varies throughout the stand. Some areas are thickly stocked while other areas have sparse or no natural tree regeneration present.

Other plant species observed include American hazel (240 stems/acre), mountain maple (40 stems/acre), red-osier dogwood, juneberry, buckthorn, bunchberry, strawberry, thimbleberry, bearberry, clintonia, wild rose, honeysuckle, twisted-stalk, princess pine, coltsfoot, wild vetch, golden rod, wild sarsaparilla, big and little leaf aster, and various grasses. At this time, these plants are not seriously competing with the natural tree regeneration.

This plantation is located along Duluth's Skyline Parkway in the Hawk Ridge Nature Reserve. Amity Creek is located just north of the stand. The area is currently used and enjoyed by bird, wildlife, and recreation enthusiasts. Trails are well-used for hiking, biking and snowmobiling.

OTHER STAND DATA
Age - Maturing; 67 years
Estimated Tree Volume (cords/acre):
  Norway pine - 35
  Scotch pine - 20
  White spruce - ½
Average Tree Diameter - 11" (Diameter Breast Height/DBH)
Site Quality - poor to good
Site Index/SI (a measure of site productivity):
  Norway pine - 50, poor to fair
  Scotch pine - 60, good
Tree Density - Overstocked
Average Basal Area/BA - 160 sq ft
Average Snags/acre - 5 (mainly Norway pine)

MANAGEMENT OBJECTIVES
Maintain a healthy pine plantation to provide bird and wildlife habitat, woodland diversity and aesthetics, and recreational pleasure. Maintain this stand as conifers because of its uniqueness in the area. Harvesting timber products is done to maintain the quality of the stand, not solely as a revenue-generating project.

MANAGEMENT RECOMMENDATIONS
The majority of this plantation is overstocked and stressed. However, the trees should respond well to a selective thinning. This thinning should be done within the next 1 to 2 years for the best stand response. Remove about 1/3 of the stand volume or about 20 cords/acre; remove less volume in sparsely stocked areas. Remove Norway pine before Scotch pine since the Norway pine is in poor to fair condition throughout much of the stand; Norway pine can be favored where it is growing well. Also favor white spruce and balsam fir that exist in the overstory and understory. Clearcut areas where trees are stressed and will not respond to a thinning. These areas are approximately ½-1 acre in size and are sparsely scattered throughout the plantation. Consider bird and wildlife habitat, recreational needs, and tree spacing and quality when determining the trees to remove. Also, reserve snags, a minimum of 1 to 3/acre, to provide dens and nesting sites for birds and wildlife. A winter thinning is recommended to minimize site and regeneration disturbance. Current wood markets should make this a no-cost project.

Reserve areas of pines on the east side of Skyline Parkway and on all steep slopes in the plantation from the thinning project. This will help to prevent soil erosion and maintain water quality and aesthetics and comply with the Best Management Practices (BMPs - see the BMP booklet in the Stewardship manual for more information).

Reserve the area of dead pine in the western finger of the stand for birds and wildlife. The scattered merchantable trees in this area should be cut because they are stressed. This area could be left as is or planted with a suitable tree and/or shrub species. Suitable species include white spruce and caragana in drier areas and black spruce, larch or tamarck in wetter areas (larch and tamarack must be planted in very open areas).

Other scattered openings could be left as they are or, if desired planted with a suitable tree species such as white or black spruce or, in very open areas, larch or tamarack and/or a suitable wildlife shrub species such as caragana. The DNR-Forestry nursery sells a shrub packet suitable for birds and wildlife and other various trees species are also available. Trees are also available through the St. Louis County SCS/SWCD and private tree nurseries. Due to good natural tree regeneration, minor, if any, tree underplanting is necessary at this time. Also, due to minimal brush, minor, if any, site preparation will be needed. Specific areas for planting should be examined and determined upon completion of the tree harvesting project. Planted areas will need to be closely examined the first 5 years after planting to determine if there is significant competition to warrant a release project. Areas where brush is overtaking the new seedlings will need to be released.

Re-examine the thinned areas of the plantation after the thinning and then periodically every 5 years. Re-examine the planted areas of the plantation periodically for the first 5 years and then every other year - release seedlings as necessary.

Projects: Selective tree thinning
Possible tree and/or wildlife shrub planting

SUMMARY

WILDLIFE HABITAT

The recommendations in this plan will help to maintain and create a variety of habitats for bird and wildlife species without disturbing raptor migration. Reserving scattered cull trees and pockets of dead trees from cutting will provide additional den sites for a variety of birds and animals.

TIMBER MANAGEMENT

The timber management and tree and shrub planting recommendations in this plan will provide valuable wildlife habitat while improving and maintaining the health and diversity of your woodlands. Harvesting will provide you with income by selling the resulting wood products for pulpwood or sawbolts. By observing young seedlings and detecting problems due to competition and/or animal damage early, you can help ensure healthy seedlings in the future.

RECREATION MANAGEMENT

Maintaining current trails for recreational uses such as hiking, biking, jogging and snowmobiling will provide many benefits for outdoor enthusiasts. Seeding bare spots and high-use trails with a grass-clover mixture will provide browse for wildlife and help prevent soil erosion and protect water quality.

APPENDIX

GOVERNMENT OFFICES - contacts for specific information:

St.Louis Co. SWCD 4850 Miller Trunk Hwy Hermantown MN 55811 722-6109
DNR-Forestry 4805 Rice Lake Rd Duluth MN 55803 723-4669
DNR-Wildlife So Hwy 33 Cloquet, MN 55720 879-0880
DNR-Fisheries 10029 No Shore Dr Duluth, MN 55804 723-4785

ADDENDUM

Woodland Stewardship Plan
Hawk Ridge Nature Reserve
City of Duluth
October 1995

MANAGEMENT RECOMMENDATIONS

1) Leave as many pines with irregular crowns, forked stems, and numerous branches as possible to maintain structural stand diversity for birds and wildlife.

2) Retain as many snags as possible in as many different size classes as possible. Where no snags are present, leave one or two stressed trees to create snags. Avoid girdling trees to create snags which provides habitat for pine bark beetles.

3) Drop 3 to 4 trees or snags per acre to provide downed logs for wildlife. Two of these snags should be limbed and two should have limbs left on to provide different habitat. This may need to be done after the logging operation if it is not possible to accomplish it during the operation.

4) In the group selection cut areas (previously known as clear-cuts), edges should be irregular (versus straight). Leave clusters of one or two snags and one or two live trees to provide perches for birds.

5) Harvesting should not begin until after December 1 since the stand is used as a bird roosting area. The ground should be frozen before any harvesting begins in order to minimize stand and soil impacts. Target the operation to begin at the end of December/beginning of January.

6) During the logging operation, haul trail use will be minimized as much as possible. Upon completion of the logging operation, these trails should be closed to avoid future use. Either drop logs across these trails as described in 3) above or place large boulders or other barriers across the ends of those trails not wanted for further use.

7) Other shrubs suitable for planting in open areas include viburnums such as high bush cranberry, and juneberry and/or mountain ash. All planting should be done in a random fashion (versus rows).

Forest_Inv1

D·U·L·U·T·H

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

1990

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	5650	42.01
6"-12"	1833	13.63
12"-18	1769	13.15
>18"	4198	31.21
TOTALS	**13450**	**100.00**

D·U·L·U·T·H

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	5632	41.87
GOOD	6731	50.04
POOR	1050	7.81
HAZARD	37	0.28
TOTALS	**13450**	**100.00**

D·U·L·U·T·H

City of Duluth
TREE SPECIES STATISTICS
10/23/97

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMUR CHOKECHERRY	37	0.28
AMERICAN ELM	1317	9.79
AMERICAN LIUDEN	875	6.51
AMUR MAPLE	331	2.46
APPLE	577	4.29
ARBORVITAE	11	0.08
BALSAM FIR	1	0.01
BLACK ASH	191	1.42
BLACK LOCUS	1	0.01
BLACK WALNUT	5	0.04
BOX ELDER	131	0.97
BUCKEYE	17	0.13
BUR OAK	9	0.07
CATALPA	1	0.01
COLORADO BLUE PINE	6	0.04
CORKTREE	2	0.01
CANADA RED CHERRY	7	0.05
FIR	20	0.15
GINKO	21	0.16
GREEN ASH	3002	22.32
HACKBERRY	314	2.33
HAWTHORNE	17	0.13
HONEYLOCUST	126	0.94
IRONWOOD	13	0.10
JACK PINE	23	0.17
JAPANESE TREE LILAC	257	1.91
LARCH	4	0.03
LITTLE LEAF LIUDEN	817	6.07
MNT. ASH	66	0.49
MUGO PINE	3	0.02
NORWAY MAPLE	474	3.52
PAPER BIRCH	36	0.27
PIN OAK	2	0.01
PRINCESS KAY PLUM	64	0.48
POPLAR	118	0.88
PRUNUS CANADENISIS	6	0.04
PRUNUS HYBRID	8	0.06
RED MAPLE	653	4.86
RED OAK	40	0.30
RIVER BIRCH	13	0.10
RUSSIAN OLIVE	4	0.03
SCOTCH PINE	1	0.01
SERVICE BERRY	6	0.04
SIBERIAN ELM	14	0.10
SILVER MAPLE	818	6.08
SPRUCE	74	0.55
SUGAR MAPLE	2830	21.04
SWAMP WHITE OAK	1	0.01
WHITE ASH	1	0.01
WHITE PINE	14	0.10

D·U·L·U·T·H

City of Duluth
TREE SPECIES STATISTICS
10/23/97

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
WHITE SPRUCE	63	0.47
WILLOW	8	0.06
TOTALS	**13450**	**100.00**

City of Duluth
TREE SPECIES STATISTICAL BREAKDOWN

Species name	*# of trees*	*% of total*
Green Ash	3002	22.32
Silver Maple	2831	21.05
American Elm	1317	9.79
American Linden	875	6.51
Little Leaf Linden	817	6.07
Sugar Maple	817	6.07
Red Maple	653	4.86
Apple	577	4.29
Norway Maple	474	3.52
Amur Maple	331	2.46
Hackberry	314	2.33
Japanese Tree Lilac	257	1.91
Black Ash	191	1.42
Box Elder	131	.97
Honeylocust	126	.94
Poplar	118	.88
Spruce	74	.55
Mountain Ash	66	.49
Princess Kay Plum	64	.48
White Spruce	63	.47
Red Oak	40	.30
Amur Chokecherry	37	.28
Paper Birch	36	.27
Jack Pine	23	.17
Ginkgo	21	.16
Fir	20	.15
Buckeye	17	.13
Hawthorne	17	.13
Ironwood	13	.10
River Birch	13	.10
Siberian Elm	14	.10
White Pine	14	.10
Arborvitae	11	.08
Bur Oak	9	.07
Willow	8	.06
Prunus Hybrid	8	.06
Canada Red Cherry	7	.05
Colorado Blue Spruce	6	.04
Serviceberry	6	.04
Black Walnut	5	.04

Larch	4	.03
Russian Olive	4	.03
Mugo Pine	3	.02
Corktree	2	.01
Pin Oak	2	.01
Balsam Fir	1	.01
Black Locust	1	.01
Catalpa	1	.01
Scotch Pine	1	.01
Swamp White Oak	1	.01
White Ash	1	.01
Totals	***13450***	***100.00***

City of Duluth
TREE DIAMETER STATISTICAL BREAKDOWN

DBH range	# of trees	% of total
<6"	5650	42.01
6"-12"	1833	13.63
12"-18"	1769	13.15
>18"	4198	31.21
Totals	***13450***	***100.00***

TREE CONDITION CLASS STATISTICAL BREAKDOWN

Condition	*# of trees*	*% of total*
Good	6731	50.04
Fair	5632	41.87
Poor	1050	7.81
Hazard	37	0.28
Totals	***13450***	***100.00***

D·U·L·U·T·H

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 2

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	141	22.10
AMERICAN LIUDEN	4	0.63
AMUR MAPLE	75	11.76
APPLE	23	3.61
BLACK ASH	30	4.70
BLACK LOCUS	1	0.16
BOX ELDER	4	0.63
BUR OAK	3	0.47
CANADA RED CHERRY	1	0.16
GREEN ASH	92	14.42
LITTLE LEAF LIUDEN	32	5.02
MNT. ASH	9	1.41
NORWAY MAPLE	25	3.92
PAPER BIRCH	2	0.31
PRINCESS KAY PLUM	22	3.45
POPLAR	7	1.10
RED MAPLE	7	1.10
RED OAK	4	0.63
SILVER MAPLE	45	7.05
SUGAR MAPLE	108	16.93
SWAMP WHITE OAK	1	0.16
WILLOW	2	0.31
TOTALS	**638**	**100.00**

City of Duluth
TREE DIAMETER STATISTICAL BREAKDOWN

DBH range	# of trees	% of total
<6"	5650	42.01
6"-12"	1833	13.63
12"-18"	1769	13.15
>18"	4198	31.21
Totals	***13450***	***100.00***

TREE CONDITION CLASS STATISTICAL BREAKDOWN

Condition	*# of trees*	*% of total*
Good	6731	50.04
Fair	5632	41.87
Poor	1050	7.81
Hazard	37	0.28
Totals	***13450***	***100.00***

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 3

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	2	3.51
6"-12"	13	22.81
12"-18	18	31.58
>18"	24	42.11
TOTALS	**57**	**100.00**

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 3

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	28	49.12
GOOD	28	49.12
POOR	1	1.75
TOTALS	**57**	**100.00**

D·U·L·U·T·H

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 3

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN LIUDEN	1	1.75
GREEN ASH	40	70.18
RED OAK	1	1.75
SILVER MAPLE	5	8.77
SUGAR MAPLE	10	17.54
TOTALS	**57**	**100.00**

D·U·L·U·T·H

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 4

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	7	100.00
TOTALS	**7**	**100.00**

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 4

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	7	100.00
TOTALS	**7**	**100.00**

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 4

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
GREEN ASH	7	100.00
TOTALS	**7**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 5

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	327	41.13
6"-12"	132	16.60
12"-18	141	17.74
>18"	195	24.53
TOTALS	795	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 5

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	285	35.85
GOOD	462	58.11
POOR	47	5.91
HAZARD	1	0.13
TOTALS	795	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 5

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	72	9.06
AMERICAN LIUDEN	15	1.89
AMUR MAPLE	7	0.88
APPLE	10	1.26
ARBORVITAE	9	1.13
BUR OAK	1	0.13
FIR	20	2.52
GREEN ASH	114	14.34
HACKBERRY	28	3.52
HAWTHORNE	1	0.13
JACK PINE	21	2.64
LITTLE LEAF LIUDEN	18	2.26
NORWAY MAPLE	22	2.77
POPLAR	3	0.38
RED MAPLE	85	10.69
RED OAK	5	0.63
SERVICE BERRY	2	0.25
SILVER MAPLE	176	22.14
SPRUCE	23	2.89
SUGAR MAPLE	152	19.12
WHITE PINE	9	1.13
WILLOW	2	0.25
TOTALS	**795**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 6

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	529	40.66
6"-12"	136	10.45
12"-18	247	18.99
>18"	389	29.90
TOTALS	1301	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 6

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	482	37.05
GOOD	759	58.34
POOR	59	4.53
HAZARD	1	0.08
TOTALS	1301	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 6

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	50	3.84
AMERICAN LIUDEN	5	0.38
AMUR MAPLE	19	1.46
APPLE	73	5.61
BALSAM FIR	1	0.08
BLACK ASH	13	1.00
BOX ELDER	9	0.69
BUCKEYE	3	0.23
CORKTREE	2	0.15
GREEN ASH	302	23.21
HACKBERRY	90	6.92
HAWTHORNE	13	1.00
HONEYLOCUST	1	0.08
IRONWOOD	3	0.23
JAPANESE TREE LILAC	9	0.69
LARCH	1	0.08
LITTLE LEAF LIUDEN	58	4.46
MNT. ASH	5	0.38
NORWAY MAPLE	35	2.69
PAPER BIRCH	6	0.46
PRINCESS KAY PLUM	12	0.92
POPLAR	2	0.15
RED MAPLE	48	3.69
RED OAK	2	0.15
RUSSIAN OLIVE	3	0.23
SERVICE BERRY	1	0.08
SILVER MAPLE	147	11.30
SPRUCE	15	1.15
SUGAR MAPLE	371	28.52
WHITE PINE	1	0.08
WILLOW	1	0.08
TOTALS	**1301**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 7

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	450	49.13
6"-12"	66	7.21
12"-18	104	11.35
>18"	296	32.31
TOTALS	916	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 7

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	391	42.69
GOOD	457	49.89
POOR	67	7.31
HAZARD	1	0.11
TOTALS	916	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 7

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMUR CHOKECHERRY	4	0.44
AMERICAN ELM	140	15.28
AMERICAN LIUDEN	64	6.99
AMUR MAPLE	123	13.43
APPLE	4	0.44
BLACK ASH	22	2.40
BLACK WALNUT	2	0.22
CANADA RED CHERRY	2	0.22
GINKO	3	0.33
GREEN ASH	41	4.48
HACKBERRY	3	0.33
JAPANESE TREE LILAC	1	0.11
LARCH	2	0.22
LITTLE LEAF LIUDEN	22	2.40
NORWAY MAPLE	24	2.62
PIN OAK	2	0.22
POPLAR	71	7.75
RED MAPLE	68	7.42
RED OAK	6	0.66
SILVER MAPLE	52	5.68
SUGAR MAPLE	259	28.28
WHITE PINE	1	0.11
TOTALS	**916**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 8

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	132	55.93
6"-12"	31	13.14
12"-18	25	10.59
>18"	48	20.34
TOTALS	236	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 8

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	83	35.17
GOOD	141	59.75
POOR	12	5.08
TOTALS	236	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 8

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	14	5.93
AMERICAN LIUDEN	20	8.47
APPLE	5	2.12
ARBORVITAE	2	0.85
CANADA RED CHERRY	1	0.42
GREEN ASH	109	46.19
HACKBERRY	3	1.27
LITTLE LEAF LIUDEN	2	0.85
MNT. ASH	2	0.85
NORWAY MAPLE	15	6.36
PAPER BIRCH	1	0.42
POPLAR	2	0.85
RED MAPLE	3	1.27
RED OAK	1	0.42
SILVER MAPLE	21	8.90
SPRUCE	8	3.39
SUGAR MAPLE	26	11.02
WHITE PINE	1	0.42
TOTALS	236	100.00

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 9

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	140	42.94
6"-12"	64	19.63
12"-18	27	8.28
>18"	95	29.14
TOTALS	326	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 9

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	114	34.97
GOOD	204	62.58
POOR	8	2.45
TOTALS	326	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 9

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	6	1.84
AMERICAN LIUDEN	9	2.76
APPLE	34	10.43
BLACK ASH	9	2.76
BOX ELDER	2	0.61
GREEN ASH	52	15.95
HACKBERRY	36	11.04
HAWTHORNE	2	0.61
HONEYLOCUST	20	6.13
JAPANESE TREE LILAC	8	2.45
LITTLE LEAF LIUDEN	20	6.13
MNT. ASH	2	0.61
NORWAY MAPLE	3	0.92
PAPER BIRCH	1	0.31
POPLAR	2	0.61
RED MAPLE	12	3.68
SILVER MAPLE	14	4.29
SUGAR MAPLE	94	28.83
TOTALS	**326**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 10

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	212	29.73
6"-12"	59	8.27
12"-18	129	18.09
>18"	313	43.90
TOTALS	713	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 10

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	303	42.50
GOOD	345	48.39
POOR	62	8.70
HAZARD	3	0.42
TOTALS	713	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 10

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	16	2.24
AMERICAN LIUDEN	84	11.78
AMUR MAPLE	4	0.56
APPLE	30	4.21
BOX ELDER	1	0.14
BUCKEYE	2	0.28
BUR OAK	2	0.28
CATALPA	1	0.14
CANADA RED CHERRY	2	0.28
GREEN ASH	30	4.21
HACKBERRY	11	1.54
LITTLE LEAF LIUDEN	19	2.66
NORWAY MAPLE	57	7.99
PAPER BIRCH	1	0.14
RED MAPLE	46	6.45
RED OAK	2	0.28
SERVICE BERRY	1	0.14
SILVER MAPLE	38	5.33
SPRUCE	5	0.70
SUGAR MAPLE	360	50.49
WHITE PINE	1	0.14
TOTALS	**713**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 11

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	202	33.01
6"-12"	61	9.97
12"-18	92	15.03
>18"	257	41.99
TOTALS	612	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 11

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	234	38.24
GOOD	351	57.35
POOR	25	4.08
HAZARD	2	0.33
TOTALS	612	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 11

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	69	11.27
AMERICAN LIUDEN	65	10.62
AMUR MAPLE	6	0.98
APPLE	6	0.98
BOX ELDER	1	0.16
GREEN ASH	65	10.62
HACKBERRY	17	2.78
HONEYLOCUST	6	0.98
JAPANESE TREE LILAC	2	0.33
LITTLE LEAF LIUDEN	17	2.78
NORWAY MAPLE	25	4.08
PAPER BIRCH	1	0.16
RED MAPLE	30	4.90
RED OAK	1	0.16
SILVER MAPLE	52	8.50
SPRUCE	2	0.33
SUGAR MAPLE	246	40.20
WILLOW	1	0.16
TOTALS	**612**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 12

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	34	19.32
6"-12"	35	19.89
12"-18	16	9.09
>18"	91	51.70
TOTALS	176	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 12

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	86	48.86
GOOD	75	42.61
POOR	14	7.95
HAZARD	1	0.57
TOTALS	176	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 12

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	2	1.14
AMERICAN LIUDEN	13	7.39
APPLE	10	5.68
BOX ELDER	3	1.70
GREEN ASH	22	12.50
HACKBERRY	8	4.55
LITTLE LEAF LIUDEN	9	5.11
NORWAY MAPLE	1	0.57
POPLAR	2	1.14
RED MAPLE	5	2.84
SILVER MAPLE	13	7.39
SUGAR MAPLE	88	50.00
TOTALS	**176**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 13

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	46	25.14
6"-12"	9	4.92
12"-18	34	18.58
>18"	94	51.37
TOTALS	183	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 13

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	74	40.44
GOOD	95	51.91
POOR	13	7.10
HAZARD	1	0.55
TOTALS	183	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 13

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	8	4.37
AMERICAN LIUDEN	31	16.94
APPLE	7	3.83
BLACK WALNUT	1	0.55
GREEN ASH	11	6.01
LITTLE LEAF LIUDEN	7	3.83
MNT. ASH	1	0.55
MUGO PINE	2	1.09
NORWAY MAPLE	8	4.37
PAPER BIRCH	2	1.09
RED MAPLE	8	4.37
RED OAK	3	1.64
SILVER MAPLE	20	10.93
SUGAR MAPLE	74	40.44
TOTALS	**183**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 14

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	201	49.63
6"-12"	28	6.91
12"-18	47	11.60
>18"	129	31.85
TOTALS	405	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 14

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	159	39.26
GOOD	219	54.07
POOR	27	6.67
TOTALS	405	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 14

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	31	7.65
AMERICAN LIUDEN	12	2.96
AMUR MAPLE	4	0.99
APPLE	51	12.59
BLACK WALNUT	1	0.25
BOX ELDER	8	1.98
BUR OAK	1	0.25
GREEN ASH	47	11.60
HACKBERRY	8	1.98
HONEYLOCUST	1	0.25
JAPANESE TREE LILAC	2	0.49
LITTLE LEAF LIUDEN	65	16.05
MNT. ASH	4	0.99
NORWAY MAPLE	26	6.42
PAPER BIRCH	2	0.49
PRUNUS HYBRID	2	0.49
RED MAPLE	7	1.73
RED OAK	1	0.25
SILVER MAPLE	21	5.19
SPRUCE	4	0.99
SUGAR MAPLE	107	26.42
TOTALS	**405**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 16

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	83	47.43
6"-12"	45	25.71
12"-18	5	2.86
>18"	42	24.00
TOTALS	175	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 16

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	92	52.57
GOOD	70	40.00
POOR	10	5.71
HAZARD	3	1.71
TOTALS	175	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 16

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMUR CHOKECHERRY	9	5.14
AMERICAN LIUDEN	14	8.00
APPLE	5	2.86
GREEN ASH	24	13.71
HACKBERRY	17	9.71
HONEYLOCUST	42	24.00
JAPANESE TREE LILAC	6	3.43
LITTLE LEAF LIUDEN	7	4.00
NORWAY MAPLE	6	3.43
RED MAPLE	7	4.00
SILVER MAPLE	6	3.43
SUGAR MAPLE	31	17.71
WHITE ASH	1	0.57
TOTALS	**175**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 17

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	151	79.06
6"-12"	8	4.19
12"-18	5	2.62
>18"	27	14.14
TOTALS	191	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 17

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	91	47.64
GOOD	90	47.12
POOR	10	5.24
TOTALS	191	100.00

Zone: 17

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMUR CHOKECHERRY	2	1.05
AMERICAN ELM	4	2.09
AMERICAN LIUDEN	5	2.62
APPLE	8	4.19
GINKO	6	3.14
GREEN ASH	4	2.09
JAPANESE TREE LILAC	5	2.62
LITTLE LEAF LIUDEN	53	27.75
MNT. ASH	1	0.52
POPLAR	3	1.57
RED MAPLE	59	30.89
SILVER MAPLE	20	10.47
SUGAR MAPLE	21	10.99
TOTALS	**191**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 18

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	59	41.84
6"-12"	39	27.66
12"-18	12	8.51
>18"	31	21.99
TOTALS	141	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 18

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	59	41.84
GOOD	63	44.68
POOR	19	13.48
TOTALS	141	100.00

Zone: 18

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	4	2.84
AMERICAN LIUDEN	2	1.42
APPLE	6	4.26
BOX ELDER	4	2.84
GREEN ASH	47	33.33
HACKBERRY	4	2.84
HONEYLOCUST	12	8.51
LITTLE LEAF LIUDEN	13	9.22
MNT. ASH	9	6.38
NORWAY MAPLE	3	2.13
RED MAPLE	5	3.55
SILVER MAPLE	5	3.55
SPRUCE	10	7.09
SUGAR MAPLE	17	12.06
TOTALS	**141**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 19

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	532	69.63
6"-12"	189	24.74
12"-18	21	2.75
>18"	22	2.88
TOTALS	764	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 19

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	369	48.30
GOOD	325	42.54
POOR	70	9.16
TOTALS	764	100.00

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 20

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	23.	20.54
6"-12"	57	50.89
12"-18	13	11.61
>18"	19	16.96
TOTALS	112	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 20

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	63	56.25
GOOD	36	32.14
POOR	13	11.61
TOTALS	112	100.00

Zone: 20

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	2	1.79
AMERICAN LIUDEN	12	10.71
BOX ELDER	1	0.89
GREEN ASH	29	25.89
HACKBERRY	8	7.14
LITTLE LEAF LIUDEN	15	13.39
NORWAY MAPLE	3	2.68
POPLAR	1	0.89
PRUNUS CANADENISIS	1	0.89
RED MAPLE	9	8.04
SILVER MAPLE	12	10.71
SUGAR MAPLE	19	16.96
TOTALS	**112**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 22

DBH RANGE	NUMBER OF TREES	% OF TOTAL
6"-12"	3	37.50
12"-18	3	37.50
>18"	2	25.00
TOTALS	8	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 22

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	1	12.50
GOOD	7	87.50
TOTALS	8	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 22

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
GREEN ASH	1	12.50
NORWAY MAPLE	3	37.50
POPLAR	2	25.00
SPRUCE	2	25.00
TOTALS	**8**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 23

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	1	2.50
6"-12"	1	2.50
12"-18	17	42.50
>18"	21	52.50
TOTALS	40	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 23

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	18	45.00
GOOD	12	30.00
POOR	10	25.00
TOTALS	40	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 23

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN LIUDEN	28	70.00
SILVER MAPLE	12	30.00
TOTALS	**40**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 24

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	98	47.34
6"-12"	10	4.83
12"-18	3	1.45
>18"	96	46.38
TOTALS	207	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 24

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	99	47.83
GOOD	89	43.00
POOR	18	8.70
HAZARD	1	0.48
TOTALS	207	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 24

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	8	3.86
AMERICAN LIUDEN	14	6.76
APPLE	25	12.08
BOX ELDER	1	0.48
GREEN ASH	38	18.36
HACKBERRY	12	5.80
JAPANESE TREE LILAC	5	2.42
LITTLE LEAF LIUDEN	6	2.90
MNT. ASH	3	1.45
NORWAY MAPLE	16	7.73
PAPER BIRCH	1	0.48
SILVER MAPLE	4	1.93
SUGAR MAPLE	74	35.75
TOTALS	**207**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 25

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	45	42.06
6"-12"	30	28.04
12"-18	1	0.93
>18"	31	28.97
TOTALS	107	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 25

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	50	46.73
GOOD	44	41.12
POOR	13	12.15
TOTALS	107	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 25

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	2	1.87
APPLE	12	11.21
GREEN ASH	46	42.99
HACKBERRY	1	0.93
LITTLE LEAF LIUDEN	16	14.95
NORWAY MAPLE	11	10.28
SUGAR MAPLE	19	17.76
TOTALS	**107**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 26

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	38	15.97
6"-12"	11	4.62
12"-18	28	11.76
>18"	161	67.65
TOTALS	238	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 26

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	102	42.86
GOOD	117	49.16
POOR	16	6.72
HAZARD	3	1.26
TOTALS	238	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 26

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	32	13.45
AMERICAN LIUDEN	16	6.72
APPLE	1	0.42
BOX ELDER	4	1.68
GREEN ASH	52	21.85
LITTLE LEAF LIUDEN	2	0.84
NORWAY MAPLE	9	3.78
PAPER BIRCH	1	0.42
RED MAPLE	1	0.42
SILVER MAPLE	15	6.30
SUGAR MAPLE	105	44.12
TOTALS	**238**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 27

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	60	27.03
6"-12"	75	33.78
12"-18	9	4.05
>18"	78	35.14
TOTALS	222	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 27

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	92	41.44
GOOD	97	43.69
POOR	33	14.86
TOTALS	222	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 27

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	20	9.01
AMERICAN LIUDEN	10	4.50
AMUR MAPLE	1	0.45
APPLE	2	0.90
CANADA RED CHERRY	1	0.45
GREEN ASH	99	44.59
LITTLE LEAF LIUDEN	18	8.11
NORWAY MAPLE	4	1.80
RED MAPLE	2	0.90
SPRUCE	1	0.45
SUGAR MAPLE	64	28.83
TOTALS	**222**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 28

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	58	32.58
6"-12"	65	36.52
12"-18	9	5.06
>18"	46	25.84
TOTALS	178	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 28

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	85	47.75
GOOD	61	34.27
POOR	32	17.98
TOTALS	178	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 28

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	26	14.61
AMERICAN LIUDEN	10	5.62
APPLE	11	6.18
BOX ELDER	4	2.25
GREEN ASH	65	36.52
JAPANESE TREE LILAC	3	1.69
LITTLE LEAF LIUDEN	25	14.04
NORWAY MAPLE	4	2.25
PRINCESS KAY PLUM	6	3.37
POPLAR	1	0.56
PRUNUS CANADENISIS	2	1.12
RED MAPLE	3	1.69
SUGAR MAPLE	18	10.11
TOTALS	**178**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 29

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	7	41.18
6"-12"	5	29.41
12"-18	4	23.53
>18"	1	5.88
TOTALS	17	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 29

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	4	23.53
GOOD	10	58.82
POOR	3	17.65
TOTALS	17	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 29

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
BOX ELDER	1	5.88
GREEN ASH	9	52.94
PAPER BIRCH	1	5.88
RED MAPLE	2	11.76
SILVER MAPLE	1	5.88
SUGAR MAPLE	3	17.65
TOTALS	**17**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 30

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	171	45.60
6"-12"	23	6.13
12"-18	26	6.93
>18"	155	41.33
TOTALS	375	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 30

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	189	50.40
GOOD	136	36.27
POOR	49	13.07
HAZARD	1	0.27
TOTALS	375	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 30

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	43	11.47
AMERICAN LIUDEN	56	14.93
AMUR MAPLE	8	2.13
APPLE	3	0.80
BOX ELDER	4	1.07
GREEN ASH	52	13.87
JAPANESE TREE LILAC	9	2.40
LITTLE LEAF LIUDEN	12	3.20
NORWAY MAPLE	5	1.33
POPLAR	4	1.07
RED MAPLE	44	11.73
RED OAK	1	0.27
SIBERIAN ELM	2	0.53
SILVER MAPLE	13	3.47
SUGAR MAPLE	118	31.47
WHITE SPRUCE	1	0.27
TOTALS	**375**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 31

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	429	37.08
6"-12"	58	5.01
12"-18	168	14.52
>18"	502	43.39
TOTALS	1157	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 31

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	539	46.59
GOOD	536	46.33
POOR	80	6.91
HAZARD	2	0.17
TOTALS	1157	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 31

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	169	14.61
AMERICAN LIUDEN	84	7.26
AMUR MAPLE	29	2.51
APPLE	24	2.07
BLACK ASH	84	7.26
BOX ELDER	11	0.95
GREEN ASH	380	32.84
HACKBERRY	8	0.69
JACK PINE	2	0.17
JAPANESE TREE LILAC	36	3.11
LITTLE LEAF LIUDEN	46	3.98
MNT. ASH	1	0.09
MUGO PINE	1	0.09
NORWAY MAPLE	36	3.11
PAPER BIRCH	6	0.52
POPLAR	1	0.09
PRUNUS HYBRID	6	0.52
RED MAPLE	19	1.64
RED OAK	11	0.95
SILVER MAPLE	18	1.56
SPRUCE	2	0.17
SUGAR MAPLE	183	15.82
TOTALS	**1157**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 32

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	119	55.87
6"-12"	34	15.96
12"-18	19	8.92
>18"	41	19.25
TOTALS	213	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 32

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	124	58.22
GOOD	37	17.37
POOR	52	24.41
TOTALS	213	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 32

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	3	1.41
AMERICAN LIUDEN	10	4.69
AMUR MAPLE	29	13.62
APPLE	4	1.88
BOX ELDER	13	6.10
GREEN ASH	69	32.39
LITTLE LEAF LIUDEN	5	2.35
MNT. ASH	7	3.29
NORWAY MAPLE	9	4.23
POPLAR	2	0.94
RED MAPLE	46	21.60
RUSSIAN OLIVE	1	0.47
SIBERIAN ELM	1	0.47
SILVER MAPLE	2	0.94
SUGAR MAPLE	8	3.76
WHITE SPRUCE	2	0.94
WILLOW	2	0.94
TOTALS	**213**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 33

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	331	57.67
6"-12"	18	3.14
12"-18	60	10.45
>18"	165	28.75
TOTALS	574	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 33

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	235	40.94
GOOD	301	52.44
POOR	38	6.62
TOTALS	574	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 33

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMUR CHOKECHERRY	1	0.17
AMERICAN ELM	148	25.78
AMERICAN LIUDEN	31	5.40
AMUR MAPLE	12	2.09
APPLE	15	2.61
BOX ELDER	12	2.09
GREEN ASH	191	33.28
HACKBERRY	13	2.26
JAPANESE TREE LILAC	52	9.06
LITTLE LEAF LIUDEN	22	3.83
MNT. ASH	2	0.35
NORWAY MAPLE	1	0.17
RED MAPLE	32	5.57
SILVER MAPLE	6	1.05
SUGAR MAPLE	36	6.27
TOTALS	**574**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 34

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	294	71.88
6"-12"	79	19.32
12"-18	20	4.89
>18"	16	3.91
TOTALS	409	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 34

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	207	50.61
GOOD	171	41.81
POOR	31	7.58
TOTALS	409	100.00

Zone: 34

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	1	0.24
AMERICAN LIUDEN	25	6.11
AMUR MAPLE	4	0.98
APPLE	78	19.07
BLACK WALNUT	1	0.24
BOX ELDER	12	2.93
GREEN ASH	61	14.91
HACKBERRY	21	5.13
HAWTHORNE	1	0.24
JAPANESE TREE LILAC	59	14.43
LARCH	1	0.24
LITTLE LEAF LIUDEN	12	2.93
NORWAY MAPLE	25	6.11
PAPER BIRCH	3	0.73
PRINCESS KAY PLUM	17	4.16
POPLAR	4	0.98
RED MAPLE	63	15.40
SCOTCH PINE	1	0.24
SILVER MAPLE	3	0.73
SUGAR MAPLE	15	3.67
WHITE SPRUCE	2	0.49
TOTALS	**409**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 36

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	36	17.91
6"-12"	18	8.96
12"-18	42	20.90
>18"	105	52.24
TOTALS	201	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 36

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	89	44.28
GOOD	90	44.78
POOR	21	10.45
HAZARD	1	0.50
TOTALS	201	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 36

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	7	3.48
AMERICAN LIUDEN	61	30.35
BLACK ASH	5	2.49
BOX ELDER	6	2.99
GREEN ASH	17	8.46
MNT. ASH	5	2.49
NORWAY MAPLE	13	6.47
PAPER BIRCH	1	0.50
POPLAR	5	2.49
RED MAPLE	5	2.49
SIBERIAN ELM	4	1.99
SILVER MAPLE	3	1.49
SUGAR MAPLE	69	34.33
TOTALS	**201**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 37

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	210	23.97
6"-12"	109	12.44
12"-18	165	18.84
>18"	392	44.75
TOTALS	876	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 37

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	348	39.73
GOOD	470	53.65
POOR	50	5.71
HAZARD	8	0.91
TOTALS	876	100.00

Zone: 37

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	230	26.26
AMERICAN LIUDEN	58	6.62
APPLE	1	0.11
BLACK ASH	24	2.74
BOX ELDER	1	0.11
COLORADO BLUE PINE	2	0.23
GREEN ASH	398	45.43
LITTLE LEAF LIUDEN	59	6.74
NORWAY MAPLE	8	0.91
PAPER BIRCH	2	0.23
RED MAPLE	25	2.85
SILVER MAPLE	6	0.68
SUGAR MAPLE	32	3.65
WHITE PINE	1	0.11
WHITE SPRUCE	29	3.31
TOTALS	**876**	**100.00**

City of Duluth
TREE DIAMETER STATISTICS
10/23/97

Zone: 38

DBH RANGE	NUMBER OF TREES	% OF TOTAL
<6"	295	33.52
6"-12"	270	30.68
12"-18	166	18.86
>18"	149	16.93
TOTALS	880	100.00

City of Duluth
TREE HEIGHT STATISTICS
10/23/97

Zone: 38

HEIGHT RANGE	NUMBER OF TREES	% OF TOTAL
FAIR	338	38.41
GOOD	410	46.59
POOR	124	14.09
HAZARD	8	0.91
TOTALS	880	100.00

City of Duluth
TREE SPECIES STATISTICS
10/23/97

Zone: 38

SPECIES NAME	NUMBER OF TREES	% OF TOTAL
AMERICAN ELM	41	4.66
AMERICAN LIUDEN	87	9.89
AMUR MAPLE	1	0.11
APPLE	28	3.18
BLACK ASH	4	0.45
BOX ELDER	28	3.18
BUCKEYE	11	1.25
BUR OAK	2	0.23
COLORADO BLUE PINE	4	0.45
GREEN ASH	325	36.93
HACKBERRY	25	2.84
LITTLE LEAF LIUDEN	37	4.20
MNT. ASH	9	1.02
NORWAY MAPLE	54	6.14
PAPER BIRCH	5	0.57
POPLAR	6	0.68
RED MAPLE	8	0.91
RED OAK	2	0.23
SIBERIAN ELM	7	0.80
SILVER MAPLE	67	7.61
SUGAR MAPLE	100	11.36
WHITE SPRUCE	29	3.30
TOTALS	**880**	**100.00**

Forest_Inv6

AERIAL PHOTOGRAPHY INTERPRETATION

of

CITY OF DULUTH'S
UNINHABITED WOODED LANDS

in the areas of

MINNESOTA POINT, PARK POINT, HEARDING ISLAND,
BRIGHTON BEACH, LESTER/AMITY, HARTLEY,
PIEDMONT, MAGNEY SNIVELY, & MISSION CREEK

completed in

NOVEMBER 1996

by

TWO BY FORESTRY
JAN BERNU
4202 Brookston Road
Cloquet, MN 55720
879-4433

MINNESOTA POINT, PARK POINT & HEARDING ISLAND AREAS

MINNESOTA POINT
LEGAL DESCRIPTION: T49N, R14W, part of Sections 12 & 13
T49N, R13W, part of Section 13

GENERAL DESCRIPTION
Approximate Acres: 145
Forested and Recreational Area containing the following:
Norway/red & White Pine: 63 acres; Diameters - 5 to 15"; Volume - 5 to15 CDS/AC (< 8" DBH) and 2,500-15,000 BF/AC (> 8" DBH)
Aspen: 7 acres; Diameters - 1 to 3"; Density - 1,000 to 2,500 STMS/AC of natural regeneration
Upland Brush: 4 acres; also contains scattered hardwoods, especially aspen and birch
Upland Grass: 68 acres; also contains scattered softwoods, especially Norway and white pine, and hardwoods, especially aspen and birch
Lowland Brush: 3 acres; also contains scattered hardwoods, especially aspen and birch

PARK POINT
LEGAL DESCRIPTION: T50N, R14W, part of Sections 34 & 35
T49N, R14W, part of Sections 2, 11, 12 & 13

GENERAL DESCRIPTION
Approximate Acres: 200
Recreational Area containing scattered hardwoods and softwoods, especially Norway and white pine; Diameters - 5 to 15"+; Volume - 0 to 10 CDS/AC (DBH < 8") and 0 to 7,500 BF/AC (DBH > 8"). This area also contains areas of scattered upland brush and grass and lowland brush and grass.

HEARDING ISLAND
LEGAL DESCRIPTION: T49N, R14W, part of Section 2

GENERAL DESCRIPTION
Approximate Acres: 20
Wildlife Area containing scattered hardwoods, especially birch and aspen, and lowland brush; Diameters - 5 to 9"; Volume - 5 to10 CDS/AC

MISCELLANEOUS COMMENTS
General Health - good; negligible insect and disease problems
General Topography - level
See Appendix for additional information

BRIGHTON BEACH/KITCHI GUMMI

LEGAL DESCRIPTION: T51N, R13W, part of Section 34
T50N, R13W, part of Sections 3, 4, 8 & 9

GENERAL DESCRIPTION
Approximate Acres: 153

Forested and Recreational Area containing the following:
Norway & Scotch Pine: 17 acres; Diameters - 5 to 9"; Volume - 15 CDS/AC; also contains scattered hardwoods, especially aspen and birch
White Spruce: 3 acres; Diameters - 5 to 9"; Volume - 10 CDS/AC
Aspen: 98 acres; Diameters - 5 to 9"; 5 to 10 CDS/AC; also contains scattered hardwoods and softwoods
Birch: 11 acres; Diameters - 5 to 9"; Volume - 5 CDS/AC; also contains scattered hardwoods
Upland Brush: 1 acre; also contains scattered hardwoods and softwoods
Rock Outcrop: 3 acres; also contains scattered hardwoods and upland brush
Recreational Area/Park & Scenic Overlooks : 20 acres; contains scattered hardwoods and softwoods and upland brush and grass

MISCELLANEOUS COMMENTS
General Health - fair to good; Norway pine & Birch - poor to fair; poor health conditions are due to stress from past droughts, insect attacks, and general site conditions
General Topography - level to gently sloping
See Appendix for additional information

LESTER/AMITY

LEGAL DESCRIPTION: T51N, R14W, part of Section 35
T51N, R13W, part of Sections 31, 32 & 33
T50N, R14W, part of Section 1
T50N, R13W, part of Sections 4, 5 & 6

GENERAL DESCRIPTION
Approximate Acres: 1,743 (excludes golf course area)

Forested and Recreational Area containing the following:
Norway & Scotch Pine: 26 acres; Diameters - 5 to 9"; Volume - 20 CDS/AC; also contains scattered hardwoods, especially aspen, and upland brush
Norway Pine: 51 acres; Diameters - 5 to 15"; Volume - 20 CDS/AC (<8" DBH); Volume - 10,000 to 12,500 BF/AC (>8" DBH); also contains scattered hardwoods, especially aspen, and upland brush
White Pine: 29 acres; Diameters - 9 to 15"; Volume - 7,500 BF/AC; also contains scattered hardwoods and softwoods
White Spruce: 1 acre; Diameters - 9 to 15"; Volume - 7,500 BF/AC
Aspen: 1,327 acres; Diameters - 5 to 9"; 5 to 15 CDS/AC; also contains scattered hardwoods, especially birch, and softwoods
Birch: 73 acres; Diameters - 5 to 9"; Volume - 5 to 10 CDS/AC; also contains scattered hardwoods, especially aspen, and softwoods
Upland Brush: 48 acres; also contains scattered hardwoods and softwoods
Upland Grass: 107 acres; also contains scattered hardwoods and softwoods
Lowland Brush: 21 acres: also contains scattered hardwoods
Rock Outcrop: 55 acres; also contains scattered hardwoods and upland brush
Recreational Area/Park: 5 acres; contains scattered hardwoods and softwoods and upland brush and grass

GOLF COURSE
- edges of fairways contain scattered hardwoods and softwoods

MISCELLANEOUS COMMENTS
General Health - fair to good; Norway pine, aspen, and birch - poor to fair, poor health conditions are due to stress from past droughts, insect attacks, and general site conditions
General Topography - rolling to steeply sloping with sheer ridges
See Appendix for additional information

HARTLEY

LEGAL DESCRIPTION: T50N, R14W, part of Sections 2, 3, 10 & 11

GENERAL DESCRIPTION
Approximate Acres: 630

Forested and Recreational Area containing the following:
Norway Pine: 24 acres; Diameters - 5 to 9"; Volume - 5 to 10 CDS/AC; also contains scattered softwoods, especially white pine, hardwoods and brush
White Pine: 17 acres; Diameters - 5 to 15"; Volume - 10 CDS/AC (<8" DBH) and 5,000 to 7,500 BF/AC (>8" DBH); also contains scattered softwoods, especially Norway pine, hardwoods and brush
Aspen: 416 acres; Diameters - 3 to 9"; Volume - 5 to 10 CDS/AC; Density - 1,500 STMS/AC of natural regeneration; also contains scattered hardwoods, especially birch, and softwoods
Upland Brush: 55 acres; also contains scattered hardwoods and softwoods
Upland Grass: 1 acre
Lowland Brush: 32 acres: also contains scattered hardwoods
Lowland Grass: 54 acres; also contains scattered brush
Rock Outcrop: 15 acres; contains scattered hardwoods and upland brush
Pond: 16 acres; beaver pond

MISCELLANEOUS COMMENTS
General Health - good; birch - poor to fair; poor health conditions are due to stress from past droughts and insect attacks
General Topography - rolling to steeply sloping with sheer ridges
See Appendix for additional information

PIEDMONT

LEGAL DESCRIPTION: T50N, R14W, part of Sections 31 & 32
T49N, R15W, part of Section 1
T49N, R14W, part of Section 6

GENERAL DESCRIPTION
Approximate Acres: 779

Forested and Recreational Area containing the following:
Aspen: 602 acres; Diameters - 5 to 9"; Volume - 5 to 15 CDS/AC; also contains scattered hardwoods, especially birch, and softwoods
Birch: 59 acres; Diameters - 5 to 9"; Volume - 5 to 10 CDS/AC; also contains scattered hardwoods, especially aspen, and softwoods
Upland Grass: 25 acres; also contains scattered hardwoods
Lowland Brush: 14 acres: also contains scattered hardwoods
Rock Outcrop: 79 acres; also contains scattered hardwoods and upland brush

MISCELLANEOUS COMMENTS
General Health - fair to good; birch - poor to fair; poor health conditions are due to stress from past droughts and insect attacks
General Topography - rolling to steeply sloping with sheer ridges
See Appendix for additional information

MAGNEY SNIVELY

LEGAL DESCRIPTION: T49N, R15W, part of Sections 22, 23, 27, 28, 33 & 34

GENERAL DESCRIPTION
Approximate Acres: 1,947 (excludes Spirit Mountain Ski Resort)

Forested and Recreational Area containing the following:
Aspen: 168 acres; Diameters - 3 to 9"; Volume - 5 to 10 CDS/AC; also contains scattered hardwoods and softwoods
Northern Hardwoods: 1,731 acres; Diameters - 5 to 9"; Volume - 10 CDS/AC; also contains scattered hardwoods, especially aspen, and softwoods
Lowland Brush: 13 acres; also contains scattered hardwoods
Lowland Grass: 9 acres: also contains scattered hardwoods
Rock Outcrop: 26 acres; also contains scattered hardwoods and upland brush

SPIRIT MOUNTAIN SKI & RECREATIONAL RESORT
- the areas between the runs contain scattered hardwoods and softwoods

MISCELLANEOUS COMMENTS
General Health - fair to good; birch and areas of aspen - poor to fair; poor health conditions are due to stress from past droughts, insect attacks, and general site conditions
General Topography - rolling to steeply sloping with sheer ridges
See Appendix for additional information

MISSION CREEK

LEGAL DESCRIPTION: T49N, R15W, Section 31 & part of Sections 32 & 33
T48N, R15W, part of Sections 4, 5 & 6

GENERAL DESCRIPTION
Approximate Acres: 2,275

Forested and Recreational Area containing the following:
White Pine: 124; Diameters - 9 to 15"+; Volume - 2,500 to 10,000 BF/AC; also contains scattered hardwoods and softwoods
Aspen: 300 acres; Diameters - 3 to 9"; Volume - 5 to 15 CDS/AC; also contains scattered hardwoods and softwoods
Birch: 49 acres; Diameters - 5 to 9"; Volume - 10 CDS/AC; also contains scattered hardwoods and softwoods
Northern Hardwoods: 1,651 acres; Diameters - 5 to 9"; Volume - 10 to 15 CDS/AC; also contains scattered hardwoods and softwoods
Upland Brush: 8 acres; also contains scattered hardwoods
Upland Grass: 89 acres: also contains scattered hardwoods
Rock Outcrop: 54 acres; contains scattered hardwoods and upland brush

MISCELLANEOUS COMMENTS
General Health - fair to good; birch and areas of aspen - poor to fair; poor health conditions are due to stress from past droughts, insect attacks and general site conditions
General Topography - rolling to steeply sloping with sheer ridges
See Appendix for additional information

APPENDIX

APPENDIX - CODES & DEFINITIONS

SPECIES CODES

Forest Types	Nonforested Types
NP - Norway/red pine	UG - upland grasses
WP - eastern white pine	UB - upland brush
SP - Scotch pine	LB - lowland brush
WS - white spruce	LG - lowland grass
ASP - trembling aspen	
BIR - paper birch	
NH - northern hardwoods	

DIAMETER CODES - DBH (from DNR Phase II Inventory manual)

1	0 to 0.9"	(stems per acre)
2	1 to 2.9"	(stems per acre)
3	3 to 4.9"	(stems per acre)
4	5 to 8.9"	(cords per acre)
5	9 to 14.9"	(cords or board feet per acre, depending on species)
6	15 to 19.9"	(cords or board feet per acre, depending on species)
7	20 to 24.9"	(cords or board feet per acre, depending on species)
8	25"+	(cords or board feet per acre, depending on species)

AVERAGE DENSITY CODES (from DNR Phase II Inventory Manual)

Code	Seedlings & Saplings (0" to 4.9" DBH) Stems/Acre	Cordwood (5" to 20"+ DBH) Cords/Acre	Sawtimber (8" & Larger DBH) Board Feet/Acre
0	125	1.5	625
1	500	5	2,500
2	1000	10	5,000
3	1500	15	7,500
4	2000	20	10,000
5	2500	25	12,500
6	3000	30	15,000
7	3500	35	17,500
8	4000	40	20,000
9	4500+	45+	22,500+

MISCELLANEOUS CODES/DEFINITIONS

STMS - stems
CDS - cords
BF- board feet
DBH - diameter at breast height
Hardwood - deciduous tree species
Softwood - coniferous tree species

APPENDIX - SUMMARY OF TIMBER SPECIES, ACREAGE, DIAMETERS, DENSITIES & VOLUMES

MINNESOTA POINT

Species Code	Approx Acres	Diameter & Density Code	Ave Volume or Density/Acre	Total Estimated Ave Volume
NP/WP	19	56	15,000 BF	285,000 BF
	14	54	10,000 BF	140,000 BF
	3	53	7,500 BF	22,500 BF
	16	52	5,000 BF	80,000 BF
	4	51	2,500 BF	10,000 BF
	6	43	15 CDS	90 CDS
	1	41	5 CDS	5 CDS
ASP	4	25	2,500 STMS	10,000 STMS
	3	22	1,000 STMS	3,000 STMS
TOTAL EST	70 Acres			537,500 BF 95 CDS

BRIGHTON BEACH/KITCHI GUMMI

Species Code	Approx Acres	Diameter & Density Code	Ave Volume or Density/Acre	Total Estimated Ave Volume
NP	16	43	15 CDS	240 CDS
SP	1	43	15 CDS	15 CDS
WS	3	42	10 CDS	30 CDS
ASP	74	42	10 CDS	740 CDS
	24	41	5 CDS	120 CDS
BIR	11	41	5 CDS	55 CDS
TOTAL EST	129 Acres			1,200 CDS

SUMMARY CONTINUED

LESTER/AMITY

Species Code	Approx Acres	Diameter & Density Code	Ave Volume or Density/Acre	Total Estimated Ave Volume
NP/SP	26	44	20 CDS	520 CDS
NP	26	44	20 CDS	520 CDS
	25	55	12,500 BF	312,500 BF
WP	29	53	7,500 BF	217,500 BF
WS	1	53	7,500 BF	7,500 BF
ASP	167	43	15 CDS	2,505 CDS
	1,118	42	10 CDS	11,180 CDS
	42	41	5 CDS	210 CDS
BIR	56	42	10 CDS	560 CDS
	17	41	5 CDS	85 CDS
TOTAL EST	1,507 Acres			537,500 BF 15,580 CDS

HARTLEY

Species Code	Approx Acres	Diameter & Density Code	Ave Volume or Density/Acre	Total Estimated Ave Volume
NP	17	42	10 CDS	170 CDS
	7	41	5 CDS	35 CDS
WP	3	53	7,500 BF	22,500 BF
	5	52	5,000 BF	25,000 BF
	9	42	10 CDS	90 CDS
ASP	378	42	10 CDS	3,780 CDS
	12	41	5 CDS	60 CDS
	26	33	1,500 STMS	39,000 STMS
TOTAL EST	457 Acres			47,500 BF 4,135 CDS

SUMMARY CONTINUED

PIEDMONT

Species Code	Approx Acres	Diameter & Density Code	Ave Volume or Density/Acre	Total Estimated Ave Volume
ASP	568	43	15 CDS	8,520 CDS
	34	41	5 CDS	170 CDS
BIR	46	42	10 CDS	460 CDS
	13	41	5 CDS	65 CDS
TOTAL EST	661 Acres			9,215 CDS

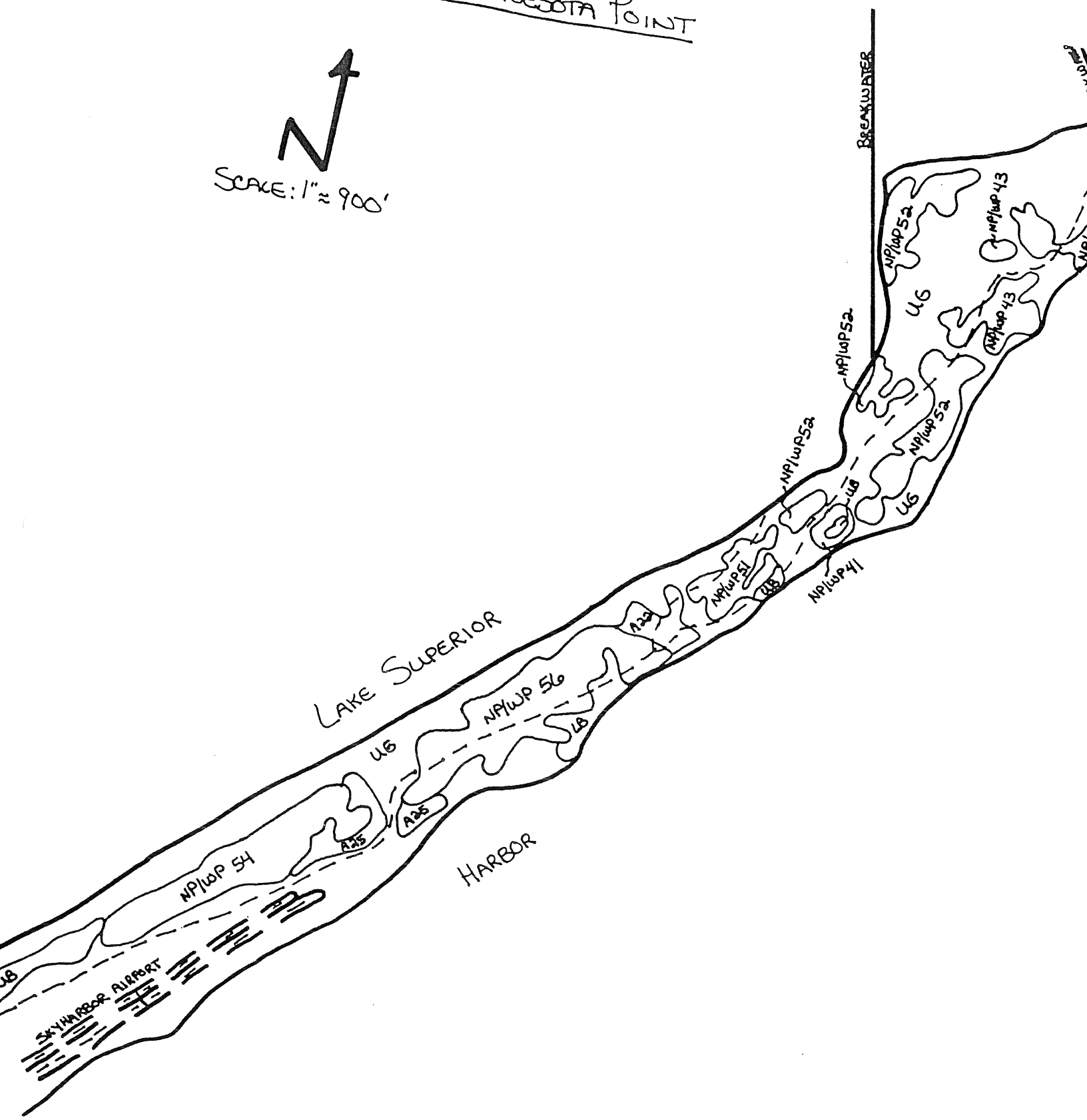
MAGNEY SNIVELY

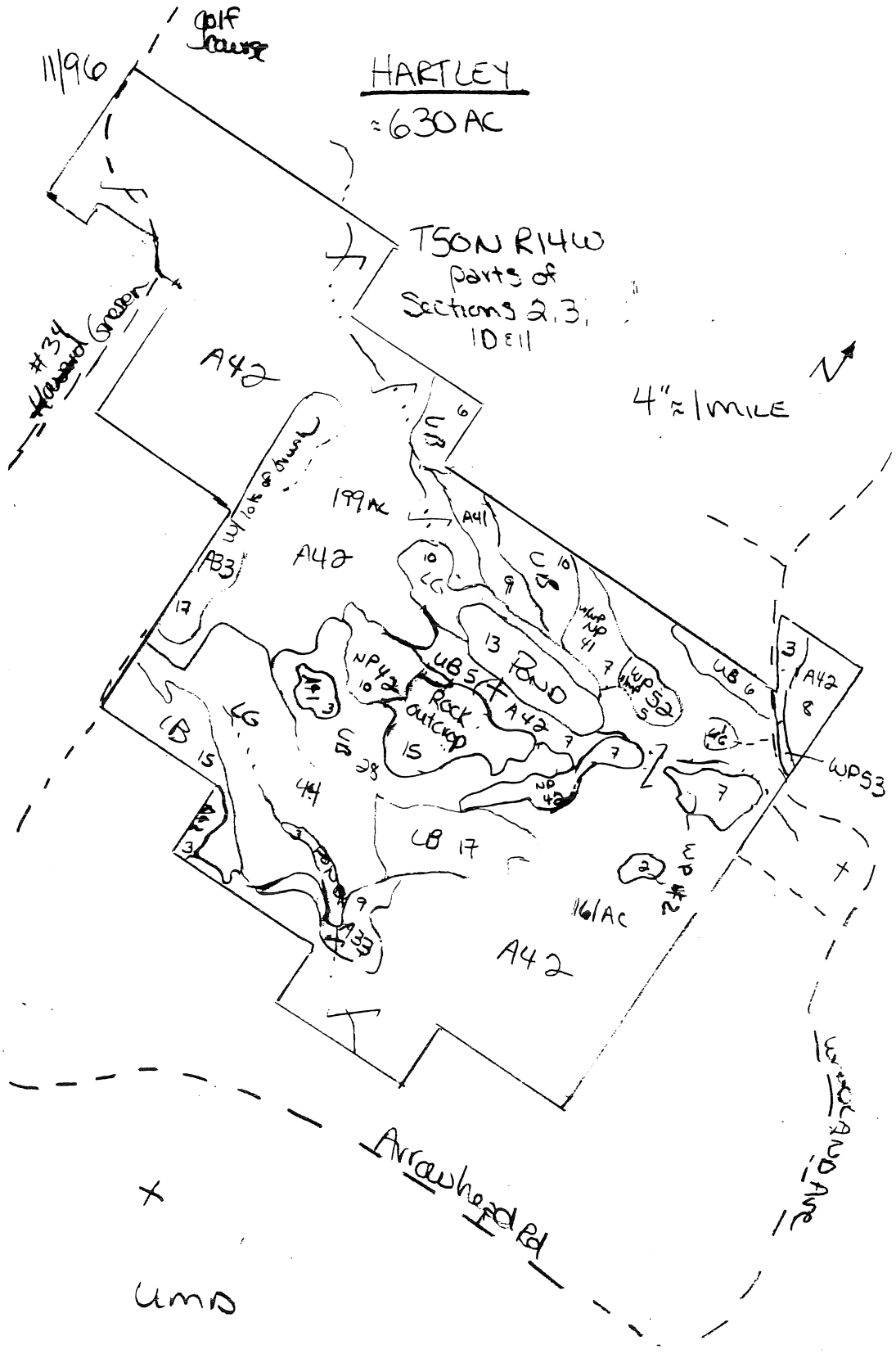
Species Code	Approx Acres	Diameter & Density Code	Ave Volume or Density/Acre	Total Estimated Ave Volume
ASP	39	42	10 CDS	390 CDS
	129	31	5 CDS	645 CDS
NH	1,731	42	10 CDS	17,310 CDS
TOTAL EST	1,899 Acres			18,345 CDS

MISSION CREEK

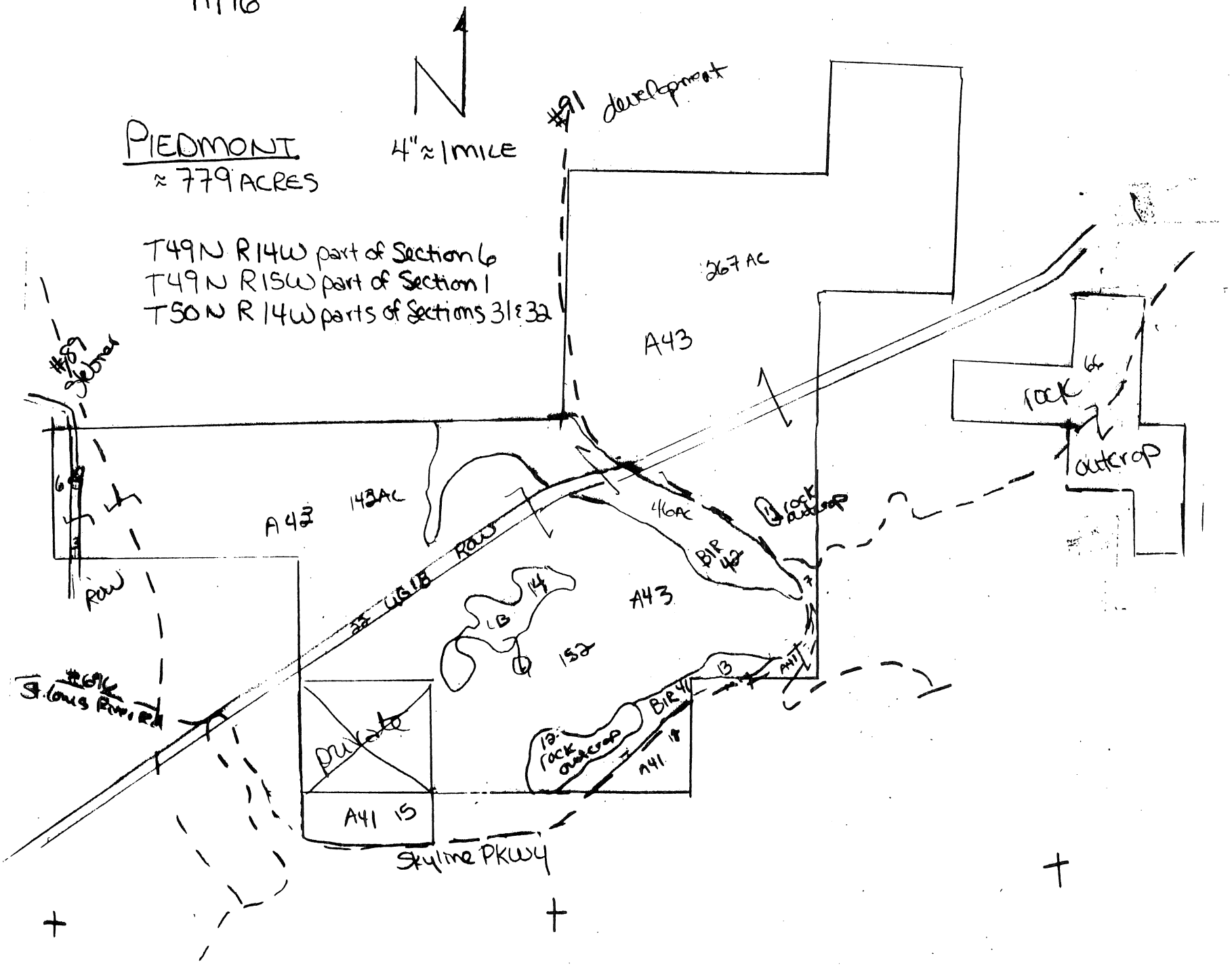
Species Code	Approx Acres	Diameter & Density Code	Ave Volume or Density/Acre	Total Estimated Ave Volume
WP	52	54	10,000 BF	520,000 BF
	41	52	5,000 BF	205,000 BF
	31	51	2,500 BF	77,500 BF
ASP	29	43	15 CDS	435 CDS
	23	42	10 CDS	230 CDS
	154	41	5 CDS	770 CDS
	94	32	10 CDS	940 CDS
BIR	49	42	10 CDS	490 CDS
NH	1,603	43	15 CDS	24,045 CDS
	48	42	10 CDS	480 CDS
TOTAL EST	2,124 Acres			802,500 BF 27,390 CDS

MINNESOTA POINT



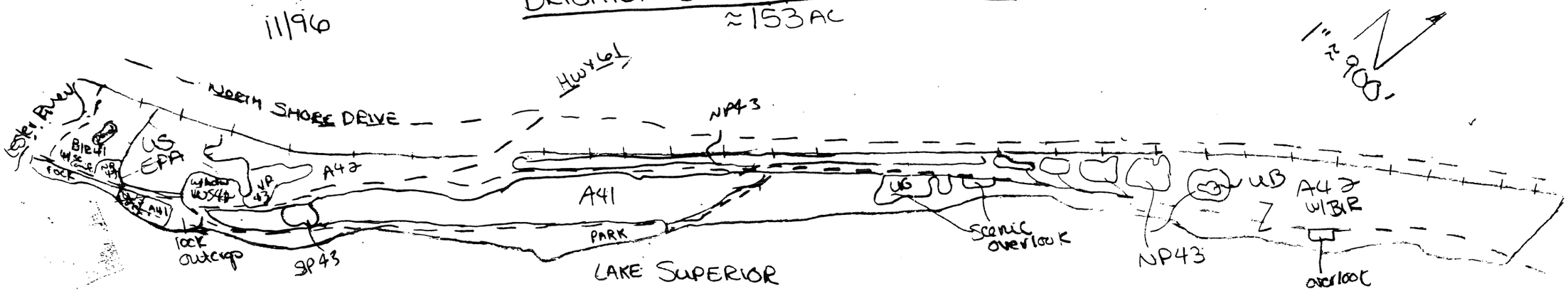

golf course
11/96
HARTLEY
≈630 AC
T50N R14W
parts of
Sections 2, 3,
10 & 11
#34
Hayward Greens
A42
4" ≈ 1 MILE
N
199 AC
A41
AB3
A42
UB 5
Rock outcrop
A42
UB 6
A42
WPS3
UB 15
UB 17
A42
116 Ac
A42
Arrowhead Rd
ICELAND AVE
UMD

11/96


PIEDMONT
≈ 779 ACRES
4" ≈ 1 MILE
T49N R14W part of Section 6
T49N R15W part of Section 1
T50N R14W parts of Sections 31 & 32
#91 development
#89 Skyline
#69 St. Louis River Rd
267 AC
A43
A42
143AC
146AC
ROW
33 UG/B ROW
BIR 42
14
152
A43
rock outcrop
rock outcrop
rock outcrop
BIR 4
A41
A41 15
Skyline PKWY

11/96

BRIGHTON BEACH / KITCHI GUMMI
≈153 AC



T50N R13W
parts of Sections 3, 4, 8 & 9

T51N R13W
part of Section 34

Marion Rd #10

Pleasant View Rd

Jefferson County Rd #37

Amity Creek

Lester River

Skyline Pkwy

Rockaway Rd

#141

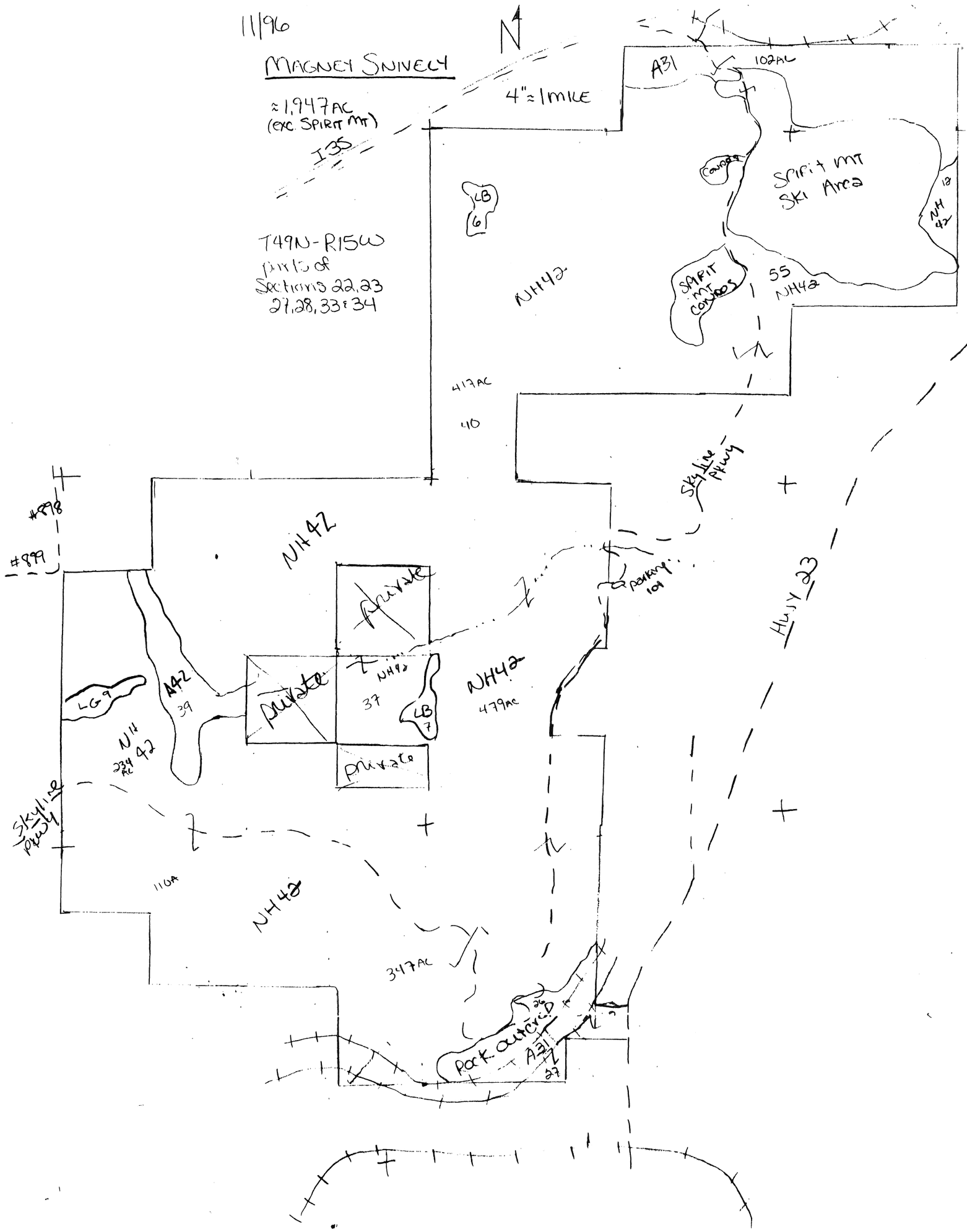
#61

#12 Lester Park Rd

4" ≈ 1 MILE

LESTER/AMITY
≈ 1,743 AC

T50N R13W
parts of Sections 4, 5 & 6
T50N R14W
part of Section 1
T51N R13W
parts of Sections 31, 32 & 33
T51N R14W
part of Section 35


11/96
MAGNEY SNIVELY
≈1,947 AC
(EXC. SPIRIT MT)
I35
4" = 1 MILE
T49N-R15W
parts of
Sections 22, 23
27, 28, 33 & 34
N
A31
102AC
Spirit MT
SKI Area
SPIRIT MT CONDOS
55
NH42
LB 6
417AC
40
#898
#899
NH42
Skyline Pkwy
parking 109
Hwy 23
private
private
private
NH42
37
LB 7
NH42
479AC
LG 7
A42
39
NH 224 AC 42
Skyline Pkwy
116A
NH42
347AC
pack. overlook
A31
27

MISSION CREEK
≈ 227 AC

4" ≈ 1 MILE

ROW

T49N R15W
parts of Sections 31 & 32
T48N R15W
parts of Sections 4, 5 & 6

#3

A41 53

NH42 34

29 AC

UG

ROW

NH43

WP51 19

517

27 AC

A41 49

Outcrop 29

23

3 101

A42

Private

Rock outcrop 22

BIE 48 49

NH42 41

38

UG

#3

Private

5D A32

A41 45

15

48

7 4 UG A41

UB 8

395

NH43 353

WP52 3

JAY COOKE

#210

NH43

ROW UG 9

14 NH 48

ST LOUIS RIVER

WP51 12

NH3

WP52 27

29

UG 9

WP54 52

FOND DU LAC

WP 52 6

WP 52 5

Private

#33

River

River

1940 street tree survey
example pages

			NM	E	M	O	B	A	SM	EV	H	UN
Atlantic Avenue -- West End -- (From Chestnut St. to N/ Line Bryant's Addition)												
Chestnut to Vernon 6/26/72	----	A-179										
Vernon to Restormel'	----	A-180						11				
Restormel to Devonshire'	----	A-181						9				
Devonshire to Exeter '	----	A-182						9				
Exeter to Wicklow '	----	A-183			4							
Wicklow to Wellington 6/26/72	----	A-184					1	2				
Wellington to 6th St.	----	A-185										
6th to 7th St. (also 9th St.)	----	A-186										
Austin Street -- Woodland -- (From Maxwell Ave. to E/L Woodland Park)												
Maxwell Ave. to Ewing Ave. 6/29/72	----	A-187										
Ewing to Kolstad	----	A-188										
Kolstad to Elysian	----	A-189										
Elysian to Rendle	----	A-190										
Rendle to Woodland 6/29/72	----	A-191								1		
Woodland to Allendale Ave. 6/19/72	----	A-192										2
Allendale to Minneapolis	----	A-193										
Minneapolis to Luther St.	----	A-194										
Avondale Street -- Lester Park -- (From W. Line Crosley Park Addition to Occident Blvd. and 72nd Ave. E. to Chase Ave.)												
48½ Ave. E. to 49th Ave. E.	----	A-195										
49th Ave. to 50th Ave. E.	----	A-196										
50th to 51st '	----	A-197										
51st to 52nd 6/12/72	----	A-198										
52nd to 53rd 6/12/72	----	A-199		8	3							1
53rd to 54th 6/12/72	----	A-200	4	12	3							
54th to 57th 6/16/72	----	A-201										1
57th to 58th (also 60th) 6/16/72	----	A-202										
58th to Occidental Blvd.	----	A-203										
72nd Ave. E. to 73rd	----	A2204										
73rd to 74th	----	A-205										
74th to 75th	----	A-206										
75th to Chase Avenue	----	A-207										
Ash Street (Bay View Add. #2) 77th Ave. W. to Fletcher St.	----	A-208										
Fletcher St. to Simonds Ave.	----	A-209										
Simonds to Irwin Ave.	----	A-210										
Irwin to Purcell Ave.	----	A-211										
Purcell to W/L Bay View Add. #2	----	A-212										
			4	20	10		1	31		1		4

TOTAL NUMBER OF VARIOUS KINDS OF TREES OWNED BY THE CITY OF DULUTH

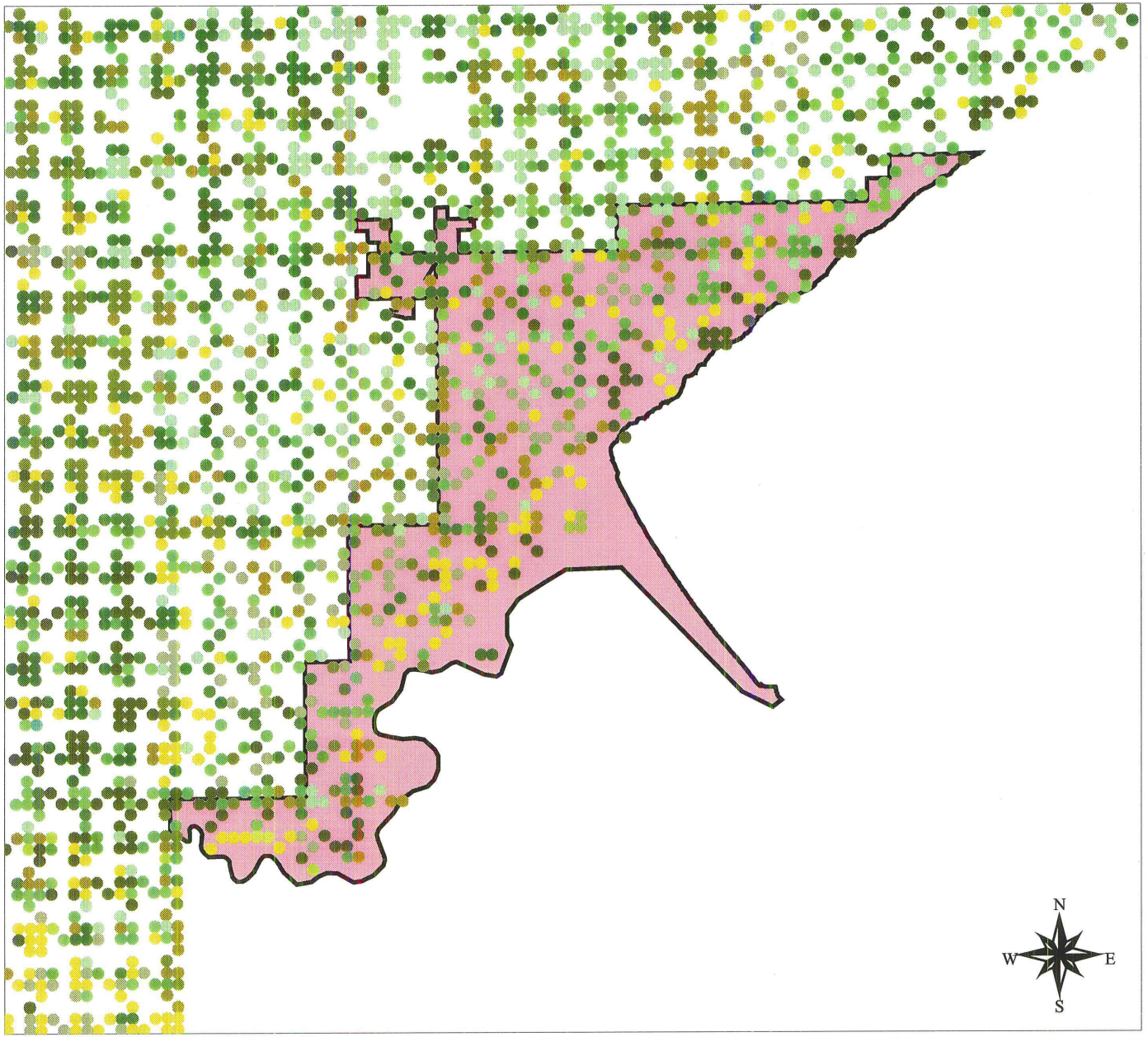
	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17
NORWAY MAPLE	1					1		2	1							
ELM	1610	814	993	424	859	200	931	327	931	133	931	94	859	152	431	36
SUGAR MAPLE	278	111	84	30	124	16	108	25	91	6	72	4	41	2	13	
OAK	4	2	2	2	3	6					1					
LINDEN BASSWOOD	58	31	40	21	56	28	62	17	43	15	46	9	16	2	6	
ASH	576	370	523	201	288	58	226	49	136	17	89	9	45	5	37	
SOFT MAPLE	569	307	514	309	707	186	887	260	814	120	734	115	401	92	226	14
EVERGREEN	33	11	13	2	16	3	13		7		5					
HACKBERRY	8	10	7	9	5	3	2	1								
BIRCH	4	4	8	2	3		5		2	1	2					
APPLE	2	1	1	1			1	1		1						

UNDESIRABLES, INCLUDING POPLAR, BOX ELDER, WILLOW, MT. ASH, PLUM, CHINESE ELM
ALL CHERRY TREES.

GRAND TOTAL OF ALL TREES COMBINED
24162

APRIL 1 - 1940.

Original Land Survey Bearing Trees



- Lite Metadata - - Get Data - - View Attribute Table - - View Sample -

Minnesota DNR - Section of Wildlife - Minnesota County Biological Survey

Original Land Survey Bearing Trees

This page last update: 02/10/2000 3:08:22 PM
metadata created using Minnesota Geographic Metadata Guidelines .

Go to Section:
1. Identification Information
2. Data Quality Information
3. Spatial Data Organization Information
4. Spatial Reference Information
5. Entity and Attribute Information
6. Distribution Information
7. Metadata Reference Information

Section 1	*Identification Information* - - - - - - *top*
Originator	Minnesota DNR - Section of Wildlife - Minnesota County Biological Survey
Title	Original Land Survey Bearing Trees
System Name	btreept3
Abstract	A point database of bearing trees used as referrences or landmarks during the original Minnesota Public Land Srvey (PLS). A variety of information are stored about bearing trees that aid in their use as indicators of vegetation conditions present at the time of the survey. This database is described in greater detail in the publication: 'Minnesta's Bearing Tree Database', by John Almendinger, Biological Report No. 56, Minnesota Department of Natural Resources, 1997.
Purpose	The data set is one source of information for scientists wishing to model environmental and ecological conditions present at the time of the original PLS survey. It contains enough potential sources of error (which require sophisticated analysis to account for) that casual use of the database, in its raw form, for critical decision-making is discouraged.
Time Period of Content Date	1908
Currentness Reference	1997
Progress	Complete
Maintenance and Update Frequency	None
Spatial Extent of Data	Statewide
Bounding Coordinates	E = -89 W = -97.5 N = 49.5

	S = 43
Place Keywords	Minnesota
Theme Keywords	Bearing Trees, Presettlement Vegetation, Public Pland Survey, PLS Sections
Theme Keyword Thesaurus	None
Access Constraints	None
Use Constraints	The Bearing Tree data included here were provided by the Minnesota Natural Heritage Program and Nongame Research Program of the Divsion of Fish and Wildlife, Minnesota Department of Natural Resources (DNR). The DNR is not responsible for any inaccuracies in these data. Use of these data does not imply endorsement or approaval by the DNR of any interpretations or products derived from the data.
Contact Person Information	Rich Baker, Information Systems Manager DNR-Section of Ecol 500 Lafayette Road, Box 25 St. Paul, MN 55155 Phone: (651) 297-3764 FAX: E-mail: rich.baker@dnr.state.mn.us
Browse Graphic File Name	btreept3_sam.gif
Browse Graphic File Description	
Associated Data Sets	The DNR data set: Original Vegetation Around Bearing Trees was developed in tandem with these data and have been derived from the same information sources

Section 2	*Data Quality Information - - - - - - top*
Attribute Accuracy	These data are derived from the Bearing Tree Database, which is in turn derived from a source (original land surveyor notes) which contains known deficiencies that impact the accuracy of attributes within the database. The purpose of the land srvey was land subdivision. The collection of information on tree species and vegetation community typing was an ancillary activity, and the accuracy of tree species typing is known to suffer as a result. Additionally, between one and five percent of the records within the database are known to be incorrect as a result of transcription errors and/or illegibility in source manuscripts. DNR Biological Report 56 (refenced in the abstract to this description) provides essential information in the handling of attribute errors within the database.
Logical Consistency	Data are topolocially correct using ARC/INFO 7.0.4.
Completeness	The data extends across the state although bearing trees were not used in many areas (owing to the fact that much of the state was unforested at the time of the survey). Therefore, extensive portions of the prairie and marsh landscapes do not include bearing trees.
Horizontal Positional Accuracy	The Bearing Tree Database should not be treated as an accurate PLS database. Most of the data are not derived from actual bearing and distance offsets from the corner locations. Instead, they are the product of a standardized offset applied in the direction indicated in the surveyor's notes. Therefore, bearing tree

	locations within the database are idealized and cannot be considered correct. Positional offsets from correct positions could be as much as 200 meters in some cases.
Vertical Positional Accuracy	Not Applicable
Lineage	The data originate with hand-written notes prepared by field surveyor's during the 19th century land subdivision of Minnesota into PLS-referenced platts. Survey notes were systematically reviewed for the purpose of identifying bearing tree species as well as the characteristics of vegetative communities and landforms along survey lines. The information was compiled in a single tabular database, and various inadequacies and deficiencies in the data were noted. The tabular database was in turn georeferenced to a coordinate file of PLS section and half-section corners called GISMO (which is a predecessor of the currently alive and well Control Point Inventory)). A problem arose at this juncture in that the majority of bearing tree locations did not actually occur at the PLS locations themselves. The general direction of the tree from the corner was provided however, and this, in conjunction with a standard off-set of 200 meters, was used to actually place the points in relation to the corners. This is a condition that all analytical users of the data should make note of. A single corner may have multiple point locations associated with them.
Source Scale Denominator	24000

Section 3	*Spatial Data Organization Information - - - - - - top*
Native Data Set Environment	ARC/INFO Coverages
Geographic Reference for Tabular Data	Not Applicable
Spatial Object Type	Point
Vendor Specific Object Types	Points
Tiling Scheme	q100k

Section 4	*Spatial Reference Information - - - - - - top*
Horizontal Coordinate Scheme	UTM
Ellipsoid	GRS1980
Horizontal Datum	NAD83
Horizontal Units	meters
Distance Resolution	meters
Altitude Datum	n/a
Altitude Units	n/a
Depth Datum	n/a

Depth Units	n/a
Cell Width	0
Cell Height	0
Latitude Resolution	0
Longitude Resolution	0
UTM Zone Number	15
SPCS Zone Identifier	0
County Coordinate Zone Identifier	0
Coordinate Offsets or Adjustments	n/a
Map Projection Name	n/a
Map Projection Parameters	n/a
Other Coordinate System's Definition	n/a

Section 5 *Entity and Attribute Information - - - - - - top*

Entity and Attribute Overview

Bearing tree locations with attributes of species; diameter; distance from monument; township, range, and sub-township reference; and vegetation type (rough correspondence to a combination of vegetation community and landscape position).

Entity and Attribute Detailed Citation

Original Land Survey Bearing Trees

--btreept3.pat–

HTML Table

ID: Unique Feature ID for cover/tile
X: UTM X coordinate in Minnesota shifted format
Y: UTM Y coordinate in Minnesota shifted format
SPECIES: code for tree type
DIAMETER: tree diameter in inches
DISTANCE: distance from corner in links (7.92 inches)
TWP: Township (tier)
RNG: Range
TIC: standard survey corner number
VEGTYPE: code for vegetation type

Section 6 *Distribution Information - - - - - - top*

Publisher Minnesota DNR - MIS Bureau

Publication Date 3/20/1998

Contact Person Information

Robert Maki, GIS Database Coordinator
Minnesota DNR
500 Lafayette Road, Box 11

	St. Paul, MN 55155 Phone: (651) 297-2329 FAX: (651) 297-4946 E-mail: robert.maki@dnr.state.mn.us
Distributor's Data Set Identifier	btreept3
Distribution Liability	None stated
Transfer Format Name	7.1.2
Transfer Format Version Number	ARC/INFO
Transfer Size	30.8
Ordering Instructions	Contact above Person
Online Linkage	DNR Data Deli

Section 7	*Metadata Reference Information - - - - - - top*
Metadata Date	3/20/1998
Contact Person Information	Robert Maki, GIS Database Coordinator Minnesota DNR - MIS Bureau 500 Lafayette Road Saint Paul, MN 55155 Phone: (651) 297-2329 FAX: (651) 297-4946 E-mail: robert.maki@dnr.state.mn.us
Metadata Standard Name	Minnesota Geographic Metadata Guidelines
Metadata Standard Version	1.1
Metadata Standard Online Linkage	http://www.lmic.state.mn.us/gc/stds/metadata.htm

Original Land Survey Bearing Trees

Table Name	Field Name	Begin Column	Definition	Valid Values	Description
btreept3.pat					ARC/INFO Point Atrribute Table (PAT)
	ID	17	5, 5, I		Unique Feature ID for cover/tile
	X	22	4, 12, F, 3		UTM X coordinate in Minnesota shifted format
	Y	26	4, 12, F, 3		UTM Y coordinate in Minnesota shifted format
	SPECIES	30	2, 2, C		code for tree type
				AH	Ash--Fraxinus nigra, F. pennsylvanica, F. americana
				AL	Alder--Alnus incana, A. viridis
				AS	Aspen--Populus tremuloides, P. grandidentata, P. balsamifera (in lesser part)
				BA	Black Ash--Fraxinus nigra
				BB	Black Birch--Betula nigra, B. alleghaniensis (in part ?)
				BE	Beech--Fagus grandifolia (unknown from Minn. possibly Carpinus caroliniana
				BG	Balm-of-Gilead--Populus balsamifera (in greater part)
				BI	Birch--Betula papyrifera, B. cordifolia
				BK	Black Oak--Quercus nigra, Q. ellipsoidalis (in part)
				BL	Blue Beech--Carpinus caroliniana
				BO	Bur Oak--Quercus macrocarpa
				BP	Babswood--Tilia americana
				BS	Black Spruce--Picea mariana
				BT	Buttonwood--Platanus occidentalis (unknown from Minn. ?)
				BU	Butternut--Juglans cinerea
				BW	Black Walnut--Juglans nigra
				BX	Box-Elder--Acer negundo
				BY	Buckeye--Aesculus glabra (unknown from Minn. ?)
				CE	Cedar--Thuja occidentalis, rarely Juniperus virginiana
				CH	Cherry--Prunus serotina, P. pennsylvanica
				CO	Cottonwood--Populus deltoides

CR	Crab-Apple--Crataegus spp.
EL	Elm--Ulmus americana, U. rubra, U. thomasii
FI	Fir--Abies balsamea
HA	Hackberry--Celtis occidentalis
HB	Hornbeam--Ostrya virginiana
HI	Hickory--Carya cordiformis, C. ovata
HT	Hawthorn--Crataegus spp.
IR	Ironwood--Ostrya virginiana
JO	Jack Oak--Quercus ellipsoidalis
JP	Jack Pine--Pinus banksiana
JU	Juniper or Red Cedar--Juniperus virginiana
LI	Linden or Basswood--Tilia americana
MA	Maple--Acer rubrum, A. saccharum, A. saccharinum
MH	Mountain Ash--Sorbus decora, S. americana
MS	Mountain Spruce--probably Picea glauca
OA	Oak--Quercus rubra, Q. macrocarpa, Q. ellipsoidalis, Q. velutina, Q. alba, Q. bicolor
PI	Pine--Pinus strobus, P. resinosa, P. banksiana
PL	Plum--probably Prunus americana
PP	Pitch Pine--Pinus banksiana
PS	Spruce Pine--Pinus banksiana
RA	Red Ash--Fraxinus pennsylvanica
RE	Red Elm--Ulmus rubra
RM	Red Maple--Acer rubrum
RO	Red Oak --Quercus rubra, Q. ellipsoidalis (in part or as hybrid)
RP	Red, Norway, or Yellow Pine--Pinus resinosa
SM	Soft or White Maple--Acer rubrum or A. Saccharinum
SO	Spanish Oak--Quercus ellipsoidalis
SP	Spruce--Picea mariana, P. glauca
SU	Sugar Maple--Acer saccharum
TA	Tamarack--Larix laricina
TH	Thorn--probably Crataegus spp.
OU	Scrub Oak--predominantly Quercus ellipsoidalis , but includes Q. macrocarpa as well

			UP	Burned Pine--Pinus spp.
			WA	White Ash--Fraxinus americana, F. pennsylvanica (in part)
			WB	White Birch--Betula papyrifera, B. cordifolia
			WC	White Cedar--Thuja occidentalis
			WE	Water Elm--Ulmus spp.
			WH	Witch Hazel--Hamamelis virginiana
			WI	Willow--Salix spp.
			WO	White Oak--Quercus alba, Q. macrocarpa (in part)
			WP	White Pine--Pinus strobus
			WS	White Spruce--Picea glauca
			XX	Illegible or Not Recorded--equivalent unknown
			YB	Yellow Birch--Betula alleghaniensis
			YP	Yellow Pine--Pinus resinosa
DIAMETER	32	4, 4, C		tree diameter in inches
DISTANCE	36	4, 4, C		distance from corner in links (7.92 inches)
TWP	40	5, 5, C		Township (tier)
RNG	45	4, 4, C		Range
TIC	49	3, 3, I		standard survey corner number
VEGTYPE	52	1, 1, C		code for vegetation type
			A	creek
			B	oak barrens
			C	plowed field, field
			D	dry ridge
			E	meadow
			F	forest, timber
			G	grove
			H	bottom
			I	pine openings, pine barrens, scattered pine
			J	pine grove
			K	scattering oak, scattering timber
			L	lake, slough, pond
			M	marsh
			N	dry land
			O	oak openings
			P	prairie
			R	river
			S	swamp

T	thicket, brush, underbrush
U	burned area
V	valley, ravine
W	windthrow, windfall
X	only tree around
Y	island
Z	wet prairie
blank	no code recorded by collector

1999-2001 MINNESOTA ReLEAF

COMMUNITY FOREST INVENTORY PROGRAM

APPLICATION FORM

Application is limited to this 4-page form - only support letters from cooperators may be attached.
Please refer to the *Application Guidelines & Community Forest Health Program Project Selection Guidelines* and the *Community Forestry Inventories* fact sheets when completing this form.

1. City & Project Name Date: 10-29-99

City (or County): Duluth Legal Description: Duluth City Limits

Project Name: Duluth Community Forest Inventory

Is this applicant applying for other MN ReLeaf funding? _X_ no ___ yes - if so, please list other project names here: _____

2. Applicant Contact Information

Applicant Organization Name: City of Duluth

Contact Person: Kelly Fleissner Phone No: 218-723-3586

Mailing Address: Room 208 City Hall City, State, Zip code: Duluth, MN 55802

Project Technical Advisor: Kelly Fleissner Phone No: 218-723-3586

Advisor Mailing Address: Room 208 City Hall, Duluth, MN 55802

DNR Area Forester: Mike Albers DNR Area: Region 2 Phone No: 218-327-4115

Make Payment Payable to - Name: City of Duluth (Auditor)

Address: Room 107 City Hall, Duluth, MN 55802

Acct. No.: _____

3. Applicant Eligibility (check one)

_X_ Municipality ___ Township ___ County ___ School District

___ Other local government (specify): _____

___ Non-profit Organization (with 501(c)(3) status)

4. Project Budget Summary

a. Non-state cash contributions:	$ 3000.00	25 % of total
b. Non-state in-kind contributions:	$ 3000.00	25 % of total
c. MN ReLeaf Funding Requested:	$ 6000.00	50 % of total
TOTAL PROJECT COST (a+b+c):	$ 12000.00	

5. Local Community Forestry Program Information

City forester (or tree inspector) - name: Kelly Fleissner phone no: 218-723-3586

address: Room 208 City Hall, Duluth, MN 55802

6. Project Summary Statement

Briefly describe the project in the space provided here. This statement will be used in program publicity and legislative reports.

The City of Duluth has over 10,000 acres of publicly owned open space, much of which is forested. But the City has no inventory of this forested open space and no comprehensive land use plan. As a result, open spaces—both public and private—are being lost at an unprecedented rate. The City recently began work on a comprehensive land use plan that will help direct future development and protect open space. As part of the effort to prepare this comprehensive plan, the Natural Resources Subcommittee of the Duluth Environmental Advisory Council is facilitating the compilation of a Natural Resources Inventory (NRI) that will include detailed information about the location, characteristics, quality, and extent of the natural resources of the Duluth area. The proposed Community Forest Inventory will provide crucial information on the size, composition, and quality of publicly owned forested lands, which will be a key part of the Natural Resources Inventory.

Data collected for the Community Forest Inventory/Natural Resources Inventory will be entered into ArcView™ Geographic Information System (GIS) software and will become part of the city's comprehensive plan. The GIS will be designed to interface smoothly with other city-maintained GIS databases.

7. Need for the Project

How will the project fill critical information or program gaps? How will it expand or improve your community Forestry Program? How will the inventory be used to better manage resources? Is this your community's first inventory, an update of a previous one or a new approach? How would the project be done without this funding?

Located on the shore of Lake Superior, Duluth is well-known as a city of great natural beauty. Part of Duluth's unique appeal is due to the presence of over 10,000 acres of publicly owned open space, much of which is forested. But most of this forested land has never been inventoried, and only about 50% of it has formal protection as parks or recreation areas. With the current increase in development pressure, open space is being lost at an unprecedented rate. And without an inventory of the city's forested land, decision-makers have no way to objectively evaluate which areas are appropriate for development or what forest types are being lost or impacted by new development.

All data collected as part of the Community Forest Inventory will be entered into an ArcInfo/ArcView GIS and will be available to help the City make informed decisions concerning management of this vast network of open space. The proposed Community Forest Inventory is the first inventory of this type for the City of Duluth. Without grant funding the project is not likely to be undertaken, because the City does not have the resources to do it. If funding is not received from MN ReLeaf, other sources of grant funding will be sought.

8. Inventory Characteristics

Describe the objectives or reasons for the inventory. Be specific about the scope and duration of the information being collected. (See "Community Forestry Inventories" fact sheet.)

The Community Forest Inventory will include publicly owned forested open space. The Inventory will provide detailed baseline data that will be used to develop a comprehensive community forest management plan as part of the city's comprehensive land use plan. A community pattern composite map will also be created. Periodic updates will be needed.

9. Variables of Interest (See "Community Forestry Inventories" fact sheet)

What specific information will be collected, e.g. location, species, maintenance needs?

The data to be collected include:

- location, size, and quality of forested areas
- forest types
- average age of trees in stand
- surrounding land uses
- water resources within forested areas

10. Project Methods

Generally, how do you plan to carry out the project? i.e. what type of activities, methods, and/or techniques will be used to achieve the project results?

qualified forestry consultant will be hired to conduct the inventory. Initial tasks will include the use of air photos,)aps, and satellite imagery to identify key areas where ground surveys are needed. When conducting the ground surveys, the consultant will use GPS so that all data is accurately georeferenced. All data collected will be entered into a GIS database at the GIS lab of the Natural Resources Research Institute.

11. Project Schedule/Timeline (note tentative dates)

Tentative Date	Primary Activity
December 1999	Project Start Up
December 1999 - April 2000	Review aerial photographs and maps
April - October 2000	Field check sites
September - December 2000	Enter data into GIS
January 2001	Project Completion

12. Data Management Capabilities

How will the information collected be maintained? Who will maintain the project database and oversee the technical operation of the system? How do you anticipate updating the data and keeping the information current? Will it be integrated with other existing databases? (Specify)

All data from the Forest Inventory will be entered into a GIS (ArcInfo/ArcView) by the GIS lab at the Natural Resources Research Institute. When completed, the database will be taken over by the City of Duluth MIS Division for ongoing use and maintenance. The Forest Inventory GIS will be integrated with the city's gray infrastructure GIS.

13. Project Leaders and Personnel

Who are the project leaders? What experiences does the applicant and/or project leader(s) have in implementing similar projects? Who are the project personnel (staff, consultants, or experienced volunteers) and what are their related qualifications and experience and their responsibility in the project? What training is needed for this project? Are new partnerships being formed to do this project? What other departments or cooperators will be involved?

The Project Leader is Kelly Fleissner, City Forester for the City of Duluth. Kelly has a degree in Forest Resources from the University of Minnesota and has 15 years of experience as city forester.

Project personnel: A qualified forestry consultant will be hired to conduct the inventory. GIS work will be done by NRRI under an existing contract with the City of Duluth for the Natural Resources Inventory, which includes the proposed Forest Inventory. Al Odean, GIS Administrator for the City of Duluth, will act as information consultant for the project.

City maintenance staff will receive training in how to use the GIS database.

The Community Forest Inventory is one piece of the Duluth Natural Resources Inventory, a project that was initiated by the Duluth Environmental Advisory Council with support from the Duluth Tree Commission. The NRI has evolved into a public-private partnership with a broad base of support that includes the City Planning Department, City Forestry, City Stormwater Utility, City GIS Department, Arrowhead Regional Development Commission, South St. Louis County Soil and Water Conservation District, Western Lake Superior Sanitary District, Minnesota Pollution Control Agency, Minnesota Department of Natural Resources, Natural Resource Research Institute, University of Minnesota Northeast Regional Agricultural and Natural Resources Sustainable Development Partnership, University of Minnesota - Duluth - Geology Department, The Nature Conservancy, and a number of private citizens.

14. Budget Breakdown

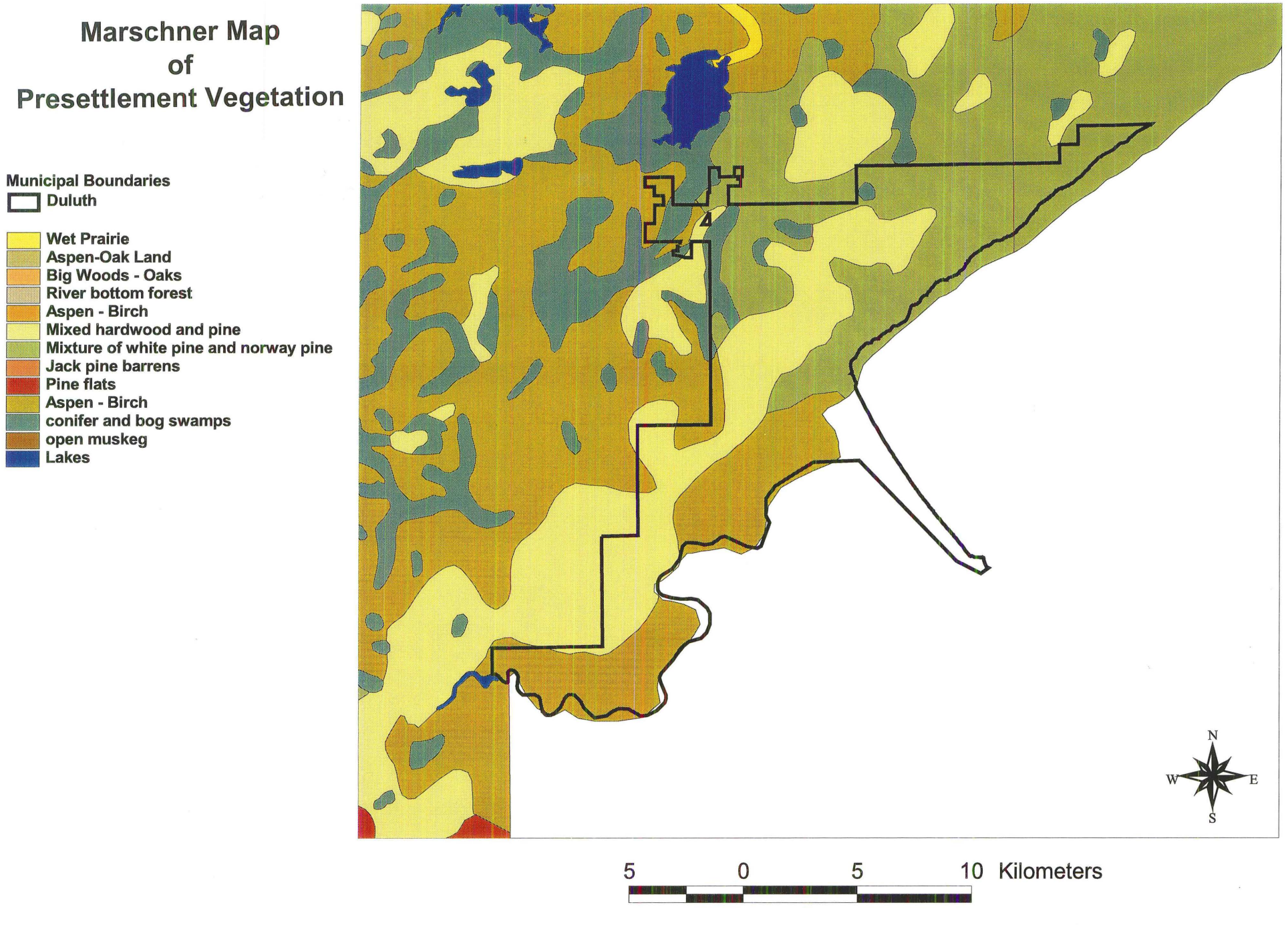
In this space please itemize the project budget specifying material, software and labor costs and the ources, amount and nature of in-kind contributions. Please note unit costs for each major item. In-ind contributions may include in-house or donated labor, goods, services, etc. (see MnReLeaf In-kind ontribution Rate Sheet). Specify funding source (in-kind, cash or grant) for each item.

QTY	ITEM (Please be specific)	UNIT COST ($)	NON-STATE IN-KIND MATCH ($ & source)	NON-STATE CASH MATCH ($ & source)	MNRL FUNDING ($)	TOTAL ($)
PROJECT PREPARATION (planning, workshops, publicity, etc.)						
20	Project leader hours to plan and design project and prepare RFP	$25/hr	$ 500.00 Source: city			$500.00
CONTRACT COSTS						
	Hire forestry consultant to do photo interpretation, GPS, and field inventory			$2000.00 Source: city	$5000.00	$7000.00
	Hire consultant to enter data into GIS			$1000.00 Source: city	$1000.00	$2000.00
100	Project leader and staff hours for project oversight and training	$25/hr	$2500.00 Source: city		$	$2500.00
MATERIALS						
					$	$
	TOTAL		$3000.00	$3000.00	$6000.00	$12000.00

I certify this information is valid and factual as described in this application and that all costs are eligible under the MINNESOTA ReLEAF Community Forest Health Program.

signature of authorized community/organization official _____ title _____ date _____

Marschner Map of Presettlement Vegetation



Minnesota Land Management Information Center Metadata Directory

Metadata Summary

Marschner Map of Presettlement Vegetation in Minnesota

Originator	U.S. Department of Agriculture, U.S. Forest Service, Minnesota Department of Natural Resources
Abstract	18 classes of presettlement vegetation as mapped by Francis J. Marschner in 1930. Marschner based his map on General Land Office Survey records from the 19th and early 20th century.
Time Period of Content Date	
Currentness Reference	1835-1905. Date of General Land Office Surveys in Minnesota. Original map created in 1930, hard copy map published in 1974, digital version distributed in 1996.
Access Constraints	Contact distributor
Use Constraints	Contact distributor
Browse Graphic File Name	none available
Distributor Contact Person	Joseph Hudak
Distributor Organization	Minnesota Department of Transportation (Mn/DOT)
Distributor Voice Phone	651-296-6116
Ordering Instructions	Contact distributor
Online Linkage	none available

Full Metadata Record

These metadata were created using the Minnesota Geographic Metadata Guidelines .

Go to Section:

1. Identification Information
2. Data Quality Information
3. Spatial Data Organization Information
4. Spatial Reference Information
5. Entity and Attribute Information
6. Distribution Information
7. Metadata Reference Information

Section 1 Identification Information

Originator	U.S. Department of Agriculture, U.S. Forest Service, Minnesota Department of Natural Resources
Title	Marschner Map of Presettlement Vegetation in Minnesota
Abstract	18 classes of presettlement vegetation as mapped by Francis J. Marschner in 1930. Marschner based his map on General Land Office Survey records from the 19th and early 20th century.
Purpose	To characterize vegetation patterns prior to European settlement.
Time Period of	

Content Date	
Currentness Reference	1835-1905. Date of General Land Office Surveys in Minnesota. Original map created in 1930, hard copy map published in 1974, digital version distributed in 1996.
Progress	Complete
Maintenance and Update Frequency	None planned
Spatial Extent of Data	State of Minnesota
Bounding Coordinates	-97.374 -89.259 49.463 43.310
Place Keywords	Minnesota
Theme Keywords	Presettlement Vegetation
Theme Keyword Thesaurus	None
Access Constraints	Contact distributor
Use Constraints	Contact distributor
Contact Person Information	Joseph Hudak, Chief Archaeologist Minnesota Department of Transportation (Mn/DOT) Cultural Resource Unit, 395 John Ireland Boulevard, Mail Stop 676 St. Paul, MN 55155-1899 Phone: 651-296-6116 FAX: 651-282-9834 E-mail: joseph.hudak@dot.state.mn.us
Browse Graphic File Name	none available
Browse Graphic File Description	Not applicable
Associated Data Sets	

Section 2 Data Quality Information - - - - - - Go back to top

Attribute Accuracy	Known deficiencies include the approximately 50 polygons that were unlabeled when received, these were corrected by comparing the unlabeled polygons with the original paper map. There are also mislabeled polygons, not all of which have been corrected.
Logical Consistency	The data is now topologically 'clean'. However, as originally delivered by the DNR, there were numerous sliver polygons and approximately 50 missing labels. There also seems to be a problem with the accuracy of the location of some of the polygon boundaries; they don't overlay the original map with expected consistency. There are missing polygons when compared with the original map. Most noticeable are the lake shorelines that match the NWI lakes more closely than the Marschner version. Mistakes seem to be most egregious

	in the northwestern part of the state.
Completeness	The entire state is covered. Incompleteness in attribute information is discussed under 'Attribute Accuracy' above.
Horizontal Positional Accuracy	Assumed to be no better than +/- 820 feet, based on the 1:500,000 scale of the Marschner map. However, the original surveys were accurate along section lines. Data within sections was extrapolated. Therefore, an accuracy of +/- 1/2 mile might be more appropriate.
Vertical Positional Accuracy	Not applicable
Lineage	3 different organizations digitized the map, students at Bemidji State University, NRRI, and Brian Hargrave at the DNR. It was ftp'd from the DNR as a zipped ARC/INFO shape (.shp) file, converted to an ARC coverage, cleaned with a .000001 fuzzy tolerance, created labels, eliminated all polygons less than 10 acres to get rid of sliver polygons, projected the coverage from NAD27 to NAD83 and added codes to the polygons with none. The statewide coverage was clipped by counties for distribution.
Source Scale Denominator	500000

Section 3 Spatial Data Organization Information - - - - - - Go back to top

Native Data Set Environment	Arc/Info 7.0.3, UNIX platform
Geographic Reference for Tabular Data	None
Spatial Object Type	Vector
Vendor Specific Object Types	Polygons
Tiling Scheme	Counties

Section 4 Spatial Reference Information - - - - - - Go back to top

Horizontal Coordinate Scheme	UTM
Ellipsoid	GRS80
Horizontal Datum	NAD83
Horizontal Units	Meters
Distance Resolution	12
Altitude Datum	Not applicable
Altitude Units	Not applicable
Depth Datum	Not applicable

Depth Units	Not applicable
UTM Zone Number	15E
Coordinate Offsets or Adjustments	None

Section 5 Entity and Attribute Information - - - - - - Go back to top

Entity and Attribute Overview

The original categories were established by Marschner. The classes are as follows:
0 UNCODED
1 PRAIRIE
2 WET PRAIRIES, MARSHES AND SLOUGHS
3 BRUSH PRAIRIE
4 ASPEN-OAK LAND
5 OAK OPENINGS AND BARRENS
6 BIG WOODS
7 RIVER-BOTTOM FOREST
8 ASPEN-BIRCH
9 MIXED HARDWOOD AND PINE
10 WHITE PINE
11 WHITE AND NORWAY PINE
12 JACK PINE BARRENS AND OPENINGS
13 PINE FLATS
14 ASPEN-BIRCH
15 CONIFER BOGS AND SWAMPS
16 OPEN MUSKEG
17 LAKES

Entity and Attribute Detailed Citation

See 'Final Report for Mn/Model: A High Probability Predictive Model of PreContact Archaeological Site Location for the State of Minnesota' (Mn/DOT, 1998).

See 'The Original Vegetation of Minnesota' by Francis J. Marschner, published by the North Central Forest Experiment Station, US Department of Agriculture, US Forest Service, Folwell Avenue, St. Paul, MN 55101, 1974 and 'Interpretation of Francis J. Marschner's Map of the Original Vegetation of Minnesota' by Miron L. Heinselman, which is printed on the back of the published map.

Section 6 Distribution Information - - - - - - Go back to top

Publisher	Minnesota Department of Transportation (Mn/DOT)
Publication Date	1998
Contact Person Information	Joseph Hudak, Chief Archaeologist Minnesota Department of Transportation (Mn/DOT) Cultural Resource Unit, 395 John Ireland Boulevard, Mail Stop 676 St. Paul, MN 55155-1899 Phone: 651-296-6116

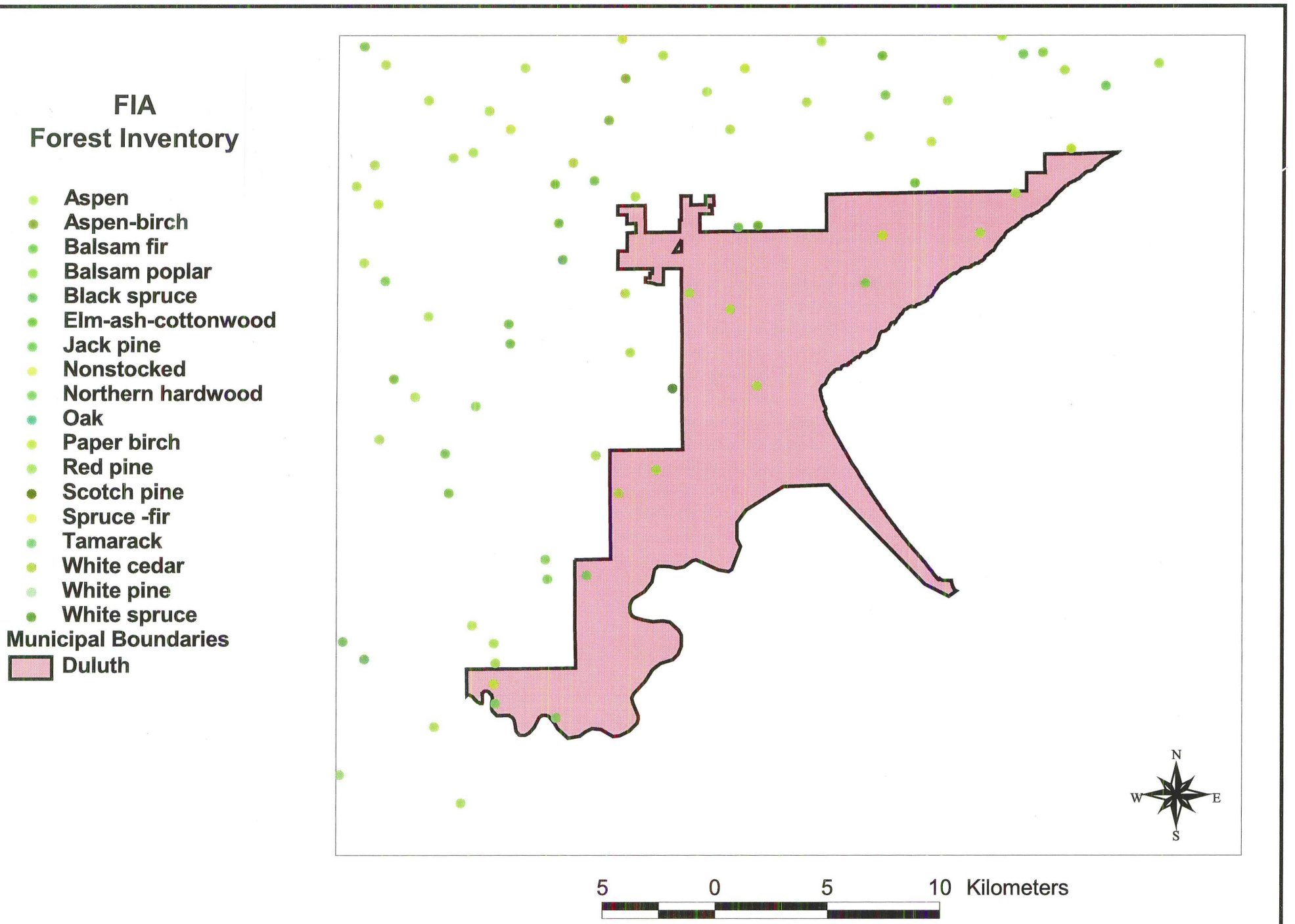
	FAX: 651-282-9834 E-mail: joseph.hudak@dot.state.mn.us
Distributor's Data Set Identifier	Marschner Map of Presettlement Vegetation in Minnesota
Distribution Liability	to be determined by Mn/DOT
Transfer Format Name	ARC/INFO
Transfer Format Version Number	7.04
Transfer Size	Varies by county
Ordering Instructions	Contact distributor
Online Linkage	none available

Section 7 Metadata Reference Information - - - - - - Go back to top

Metadata Date	11/02/1998
Contact Person Information	Joseph Hudak, Chief Archaeologist Minnesota Department of Transportation (Mn/DOT) Cultural Resource Unit, 395 John Ireland Boulevard, Mail Stop 676 St. Paul, MN 55155-1899 Phone: 651-296-6116 FAX: 651-282-9834 E-mail: joseph.hudak@dot.state.mn.us
Metadata Standard Name	Minnesota Geographic Metadata Guidelines
Metadata Standard Version	1.2
Metadata Standard Online Linkage	http://www.lmic.state.mn.us/gc/stds/metadata.htm

This page last updated 11/02/1998.

Go back to top


FIA
Forest Inventory
Aspen
Aspen-birch
Balsam fir
Balsam poplar
Black spruce
Elm-ash-cottonwood
Jack pine
Nonstocked
Northern hardwood
Oak
Paper birch
Red pine
Scotch pine
Spruce -fir
Tamarack
White cedar
White pine
White spruce
Municipal Boundaries
Duluth
N
W
E
S
5
0
5
10
Kilometers

The Eastwide Forest Inventory Data Base: Users Manual

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References.....
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Appendix 2—FIA Survey Unit Names and Codes.....
Appendix 3—Species Groups Used by Eastern FIA Projects.....

Mark H. Hansen, Research Forester, received a B.S. in forest science from the University of Minnesota in 1976, an M.S. in forest biometry from the University of Wisconsin-Madison in 1977, and a Ph.D. in forest biometry from the University of Minnesota in 1990. He joined the Forest Service in 1978, and has been working with the North Central Station's Forest Inventory and Analysis Unit since 1979.

Thomas Frieswyk, Forester, received a B.S. in forestry from the University of Massachusetts in 1975 and an M.S. in forest ecology from Michigan State University in 1978. He joined the Bureau of Indian Affairs in 1978 and worked on the Colville Indian Reservation. In 1979, he transferred to the Forest Service and has been working with the Forest Inventory and Analysis Unit at the Northeastern Station since.

Joseph F. Glover, Forester, received a B.S. in forestry from the University of Georgia in 1970. He joined the Forest Service in 1971, and has been working with Southeastern Station's Forest Inventory and Analysis Unit since that time.

John F. Kelly, Supervisory Research Forester, received a B.S. in forest management from Michigan State University in 1969 and an M.S. in forest economics from Auburn University in 1985. He worked for the Alabama Forestry Commission from 1972 to 1985, and joined the Forest Service in 1985. He has been working with the Forest Inventory and Analysis Unit of the Southern Forest Experiment Station since.

Foreword

Forest Inventory and Analysis (FIA) is a continuing endeavor mandated by Congress in the Forest and Rangeland Renewable Resources Planning Act of 1974 and the McSweeney-McNary Forest Research Act of 1928. Its objective is to periodically determine the extent, condition, and volume of timber, growth, and depletions of the Nation's forest land. This kind of up-to-date information is essential to frame realistic forest policies and programs. USDA Forest Service regional experiment stations are responsible for conducting these inventories and publishing summary reports for individual States.

Forest inventories for the Eastern United States are conducted by four experiment stations (fig. 1).

For those interested in further analysis, the Forest Service can also provide parts of the data collected in each inventory. This report describes a standard format in which data can be obtained at a reasonable cost by anyone. This standard format, referred to as the Eastwide Data Base (EWDB) structure, was developed to provide users with as much data as possible in a manner consistent among States. EWDB files can be obtained for any post-1988 State inventory, soon after the inventory is finalized. Files for many State inventories conducted before 1988 are also available; however, some data fields may be empty or the items may not have been collected or computed as described in this report. These inconsistencies will be described in an addendum to this document for each State.

CHAPTER 1—THE EASTWIDE DATA BASE

Periodic forest inventories are conducted for every State in the United States. In the East, these inventories are usually conducted every 5 to 15 years. Inventory findings are published in a series of statistical and analytical reports produced by USDA Forest Service regional experiment stations. However, many forest inventory data users require unpublished information that can be produced from the data collected in State inventories. Special information needs include:

1. Standard tables for geographic areas other than those published
2. Resource data that are consistent for all States
3. Projections of timber resources based on various assumptions and models
4. Information about specific conditions and species needed for detailed analyses.

In the past, special data requests have been handled differently by each of the four Eastern Forest Inventory and Analysis (FIA) projects, depending on the type of request and each project's data processing capabilities. It has been particularly difficult to analyze data from more than one FIA project because of inconsistencies in data collection and processing methods.

To make FIA data more compatible among States, a set of core tables was developed (Appendix 1). The core tables, now published in every Eastern FIA report, present basic timber resource information in a consistent format from one State to another. The introduction of the core tables made it easier to compare the forest resources of areas in different States and to assess the total resource of an area that crosses State and/or region boundaries.

A more recent effort to provide consistent FIA data throughout the East, has been the creation of the Eastwide Data Base (EWDB) for FIA plot data. Each FIA project produces a set of data files for the most recent inventory of each State in its area of responsibility. All the files are written in the same format and contain all the data items needed to produce the core tables, plus other data items that all four projects collect. The EWDB contains all the data needed to run the Timber Resource Inventory Model (TRIM) (Tedder 1983). Items not available from all four projects are not part of the EWDB. The EWDB data files can be produced for a State as soon as that State's statistical report is completed. An outside user can then easily obtain a copy of this file at a reasonable cost (presently $500 per State) for their own analysis.

Chapter 2 of this publication describes the FIA sampling and estimation procedures. Chapter 3 presents the EWDB structure in detail. Chapter 4 explains how to use the files to compute basic estimates of area, volume, biomass, number of trees, growth, mortality, and removals. The last chapter tells how to obtain copies of the EWDB for a State.

CHAPTER 2.—FIA SAMPLING AND ESTIMATION PROCEDURES

Users of the Eastwide Data Base need a basic understanding of FIA sampling and estimation procedures to understand the type of data available. Here, we present a general discussion of these procedures. Specific sampling methods differ among regions and even among States within a region. Publications cited in this manual give more detailed information about methods used by each region. If you need more information about sampling procedures for a specific State, contact the FIA project responsible for that State's inventory.

Each State inventory begins with the interpretation of an aerial-photo sample that classifies the land by various photo classes. The total area of a sample comes from outside sources (usually Bureau of Census reports). The photo classes used are based on land use (pasture, cropland, urban, etc.). For forested land, more detailed classes are sometimes defined based on criteria such as forest type, volume per acre, stand size, stand density, ownership, and stand age. Then, ground plots are measured to adjust the aerial photo sample for changes since the date of photography and misclassification and to obtain estimates that cannot be made from the aerial photography. The photo classification of these ground plots, together with the area estimates from the photo sample, is used to assign area expansion factors to all ground plots. These area expansion factors are used to expand values observed on the plot from a per acre basis to a population basis. An area expansion factor is basically the area (in acres) that the plot represents for estimation purposes. The sampling area, or level at which expansion factors are assigned, is different from State to State, as is the scheme used to assign photo-interpretation classes. For the details of how these expansion factors were assigned to the ground plots for a particular State, contact the appropriate FIA project.

FIA plots are designed to cover a 1-acre sample area; however, not all trees on the acre are measured. Various arrangements of fixed radius and variable radius (prism) sample points are used to select sample trees to be measured. Ground plots may be new plots that have never been measured, or remeasurement plots that were measured in the previous inventory. For all plots, several observations are recorded for each sample tree, including its diameter breast height (d.b.h.), species, and other measurements that enable us to predict the tree's volume, growth rate, and quality. These tree measurements form the basis of the data on the tree records in the EWDB.

Some of the data items in the EWDB come directly from field measurements; others are computed from tree measurements. Net cubic foot volume is a computed item. Each FIA project uses some type of volume equation to compute this volume based on d.b.h. and other tree and stand attributes. Although equations differ from State to State, they were all designed to compute the same volume.

One important computed item is the tree expansion factor VOLFAC. This item expresses the number of trees per acre that each sampled tree represents in the current inventory. It is the inverse of the size of the plot the tree was sampled on. For example, if the plot design samples trees under 5 inches d.b.h. on a single one-one hundredth-acre fixed radius plot, this item would have the value 100 trees per acre for a tree less than 5 inches d.b.h. If trees 5 inches d.b.h. and larger are sampled with ten 37.5 BAF (English) prism points, as is common with FIA plots, the expansion factor would depend on the d.b.h. of the tree. Under such a sample, a 14.0-inch tree would have an expansion factor of 3.51 trees per acre, again the inverse of the plot size[1].

[1] *The plot size of a 14.0-inch tree on a single 37.5 BAF (English) prism plot would be: (14.02 x pi)/(37.5*

x 22 x 122) = 0.0285 acres. The plot size of this tree on a 10-point cluster would be 10 times this or 0.285 acres, producing an expansion factor of 3.51.

Two other computed expansion factors are in the data base: MORTFAC and REMVFAC. They are used to compute mortality and removals. The mortality factor (MORTFAC) expresses an estimate of how many trees per acre of annual mortality are represented by a given sample tree. This factor is the number of trees per acre of annual mortality that the sample tree represents. In sample designs that have remeasurement plots, this value is zero for a tree that did not die over the remeasurement period. For trees that did die, MORTFAC is a function of the tree expansion factor and the remeasurement period. Some State inventories also estimate mortality from new ground plots. In these cases, mortality is estimated from either a mortality prediction equation that predicts the probability that a tree will die over some time period, or from a field estimate of mortality based on the measurement of dead trees and an estimate of when they died.

The removals factor (REMVFAC) is computed and used like MORTFAC. REMVFAC is the number of trees per acre of annual removals that the sample tree represents. It is computed based on observations of trees cut on either new or remeasured plots, depending on the inventory design. None of the Eastern FIA projects use removals prediction equations to estimate removals.

The items in the plot record are either observations of a specific condition at the plot center or estimates of average conditions on the acre sampled by the plot. Ownership is an example of a specific condition recorded at plot center, rather than averaged over the plot. If a plot area overlaps more than one owner, the ownership at plot center determines the recorded ownership class. Basal area is an example of an item averaged over the entire plot. If the plot falls in two stands with different basal areas, the value recorded in BACUR will represent their average basal area. In some State inventories, plots falling on more than one stand are shifted into one stand. EWDB users concerned about field procedures should check with the FIA project for more information.

We have tried to make the data in the EWDB as consistent as possible from one State to another. Therefore, although differences in field and estimation procedures do exist between States, the data in the EWDB for different States are compatible. The minor differences that do exist should have little or no impact on most uses of this data.

Accuracy Standards

Forest inventory plans are designed to meet sampling error standards for area, volume, growth, and removals provided in the Forest Service Handbook. These standards, along with other guidelines, are aimed at obtaining comprehensive and comparable information on timber resources for all parts of the country. In the East, FIA inventories are commonly designed to meet the specified sampling errors at the State level at the 67-percent confidence limit (one standard error). A 3-percent error per 1 million acres of timberland is the maximum allowable sampling error for area. A 5-percent error per 1 billion cubic feet of growing stock on timberland is the sampling error goal for volume, removals, and net annual growth.

Caution: FIA inventories are extensive inventories that provide reliable estimates for large sampling areas. As data are subdivided into smaller and smaller areas, such as a geographic unit or a county, the sampling errors increase and the reliability of the estimates decreases. For example, a State with 5 million acres of timberland would have a maximum allowable sampling error for area of 1.3 percent, a geographic unit within that State with 1 million acres of timberland would have a 3.0 percent maximum allowable sampling error, and a county within that State with 100 thousand acres would have a 9.5

percent maximum allowable sampling error at the 67-percent level.

CHAPTER 3.—DATA BASE STRUCTURE

The Eastwide Data Base has a simple hierarchical structure. This structure corresponds to FIA plot collection and data processing methods and contains data at three levels. The highest level is the county, followed by the plot level, and then the tree level.

Data are stored as one of three record types (10-county, 20-plot, 30-tree), each with its own format. A record contains information for one level of the hierarchy.

The EWDB consists of separate sequential files for each State. Each flat file is made up of all three record types. Files for a particular State are maintained by the FIA project responsible for the State's inventory (fig. 1). Copies can be obtained directly from the FIA projects (see Chapter 4).

The following is a detailed description of the format of the three record types in the EWDB. The description of each record type begins with a table (tables 1, 2, and 3) that gives the name of each element or data item in the record, the FORTRAN format that should be used to read the item, the columns it occupies, and the unit of measure of the item. The final column in each of these tables shows the key items that uniquely identify an occurrence of a data record. For record type 20, the plot record, this table also contains a section that explains what kinds of plots each data item comes from. For example, data items related to forest cover are not recorded for plots on nonforest land.

For each data item in a record, there is a section that includes all the information in tables 1, 2, and 3, plus a longer name for the data item and a detailed description that includes information on how the item was measured or estimated, and how the item can be used. For coded items, a listing of the possible codes and their meanings is also given.

Record Type 10

Table 1.—Record type 10: county record

Element name	FORTRAN read format	Columns occupied[1]	Units of measure	Key data items
1. RECTYPE	I2	1-2	Coded	
2. STATE	I2	3-4	Coded	X
3. UNIT	I1	5	Coded	
4. COUNTY	I3	6-8	Coded	X
5. CTYNAM	A28	13-40	Name	
6. STNAME	A2	41-42	Name	
7. CYCLE	I2	43-44	Number	
8. DATE	I4	45-48	Year	

[1] *Columns 9-12 contain 0000 on all county records.*

1. **RECTYPE** (coded) I2 Col. 1-2
   Record type—Record type 10 contains information that identifies and describes the county. There is one record type 10 for each county in the State covered by an EWDB file.

2. **STATE** (coded)
   State code—The two-digit Bureau of the Census, Federal Information Processing Standards (FIPS) code number of the

FIA (Forest)

The Eastwide Data Base has a simple hierarchical structure. This structure corresponds to FIA plot collection and data processing methods and contains data at three levels. The highest level is the county, followed by the plot level, and then the tree level.

Data are stored as one of three record types (10-county, 20-plot, 30-tree), each with its own format. A record contains information for one level of the hierarchy.

The EWDB consists of separate sequential files for each State. Each flat file is made up of all three record types. Files for a particular State are maintained by the FIA project responsible for the State's inventory (fig. 1). Copies can be obtained directly from the FIA projects (see Chapter 4).

The following is a detailed description of the format of the three record types in the EWDB. The description of each record type begins with a table (tables 1, 2, and 3) that gives the name of each element or data item in the record, the FORTRAN format that should be used to read the item, the columns it occupies, and the unit of measure of the item. The final column in each of these tables shows the key items that uniquely identify an occurrence of a data record. For record type 20, the plot record, this table also contains a section that explains what kinds of plots each data item comes from. For example, data items related to forest cover are not recorded for plots on nonforest land.

For each data item in a record, there is a section that includes all the information in tables 1, 2, and 3, plus a longer name for the data item and a detailed description that includes information on how the item was measured or estimated, and how the item can be used. For coded items, a listing of the possible codes and their meanings is also given.

Record Type 10

Table 1.—Record type 10: county record

Element name	FORTRAN read format	Columns occupied[1]	Units of measure	Key data items
1. RECTYPE	I2	1-2	Coded	
2. STATE	I2	3-4	Coded	X
3. UNIT	I1	5	Coded	
4. COUNTY	I3	6-8	Coded	X
5. CTYNAM	A28	13-40	Name	
6. STNAME	A2	41-42	Name	
7. CYCLE	I2	43-44	Number	
8. DATE	I4	45-48	Year	

1 Columns 9-12 contain 0000 on all county records.

1. RECTYPE (coded) I2 Col. 1-2 — Record type—Record type 10 contains information that identifies and describes the county. There is one record type 10 for each county in the State covered by an EWDB file.

2. STATE (coded) I2 — State code—The two-digit Bureau of the Census, Federal Information Processing Standards (FIPS) code number of the State. For States in the EWDB, these codes are:

Col. 3-4

01	Alabama	24	Maryland	40	Oklahoma
05	Arkansas	25	Massachusetts	42	Pennsylvania
09	Connecticut	26	Michigan	44	Rhode Island
10	Delaware	27	Minnesota	45	South Carolina
12	Florida	28	Mississippi	46	South Dakota
13	Georgia	29	Missouri	47	Tennessee
17	Illinois	31	Nebraska	48	Texas
18	Indiana	33	New Hampshire	50	Vermont
19	Iowa	34	New Jersey	51	Virginia
20	Kansas	36	New York	54	West Virginia
21	Kentucky	37	North Carolina	55	Wisconsin
22	Louisiana	38	North Dakota	72	Puerto Rico
23	Maine	39	Ohio		

3. UNIT (coded) I1 — Survey unit number—Forest Inventory and Analysis survey unit identification number. Survey units are groups of counties within each State. See Appendix 2 for codes.
Col. 5

4. COUNTY (coded) I3 — County code—The three-digit FIPS code number for each county, parish, or other similar governmental unit in a State. FIPS codes from the Bureau of the Census, 1980, are used.
Col. 6-8

5. CTYNAM (name) A28 — County name—County name as recorded by the Bureau of the Census, 1980. County names are left justified. Only the first 28 characters of the county name are used.
Col. 13-40

6. STNAME (name) A2 — State name—The two-character State abbreviation.
Col. 41-42

AL	Alabama	MD	Maryland	OK	Oklahoma
AR	Arkansas	MA	Massachusetts	PA	Pennsylvania
CT	Connecticut	MI	Michigan	RI	Rhode Island
DE	Delaware	MN	Minnesota	SC	South Carolina
FL	Florida	MS	Mississippi	SD	South Dakota
GA	Georgia	MO	Missouri	TN	Tennessee
IL	Illinois	NE	Nebraska	TX	Texas
IN	Indiana	NH	New Hampshire	VT	Vermont
IA	Iowa	NJ	New Jersey	VA	Virginia
KS	Kansas	NY	New York	WV	West Virginia
KY	Kentucky	NC	North Carolina	WI	Wisconsin
LA	Louisiana	ND	North Dakota	PR	Puerto Rico
ME	Maine	OH	Ohio		

7. CYCLE (number) I2 — Inventory cycle number—Identifies the current cycle number for the data in a data base. For example, a 4 would indicate the data came from the fourth inventory of that State.
Col. 43-44

8. DATE (year) I4 — Date of inventory—The calendar year that the current inventory data represent—for example, 1984. FIA data are often collected over more than 1 year; however, a specific year is

Col. 45-48 selected that indicates most data were collected. FIA publications based on an inventory are said to be an analysis of the forest resource as of this date.

Record Type 20

Table 2.—Record type 20: Plot record

Element name	FORTRAN read format	Columns occupied	Units of measure	Coded on1	Key data items
1. RECTYPE	I2	1-2	Coded	A	
2. STATE	I2	3-4	Coded	A	X
3. UNIT	I1	5	Coded	A	
4. COUNTY	I3	6-8	Coded	A	X
5. PLTNUM	I4	9-12	Coded	A	X
6. OWNER	I2	13-14	Coded	F	
7. TYPCUR	I2	15-16	Coded	F	
8. TYPOLD	I2	17-18	Coded	F	
9. STDAGE	I3	19-21	Years	T	
10. STDSIZE	I1	22	Coded	F	
11. STORCUR	I1	23	Coded	T	
12. STOROLD	I1	24	Coded	T	
13. SITECL	I1	25	Coded	T	
14. SI	I2	26-27	Feet	T	
15. SIAGE	I2	28-29	Years	T	
16. ADFOR	I3	30-32	Coded	A	
17. GLUCUR	I2	33-34	Coded	A	
18. GLUOLD	I2	35-36	Coded	A	
19. BA	I3	37-39	Sq.ft.	T	
20. SLOPE	I2	40-41	Percent	T	
21. ASPECT	I3	42-44	Degrees	T	
22. PHYSIO	I1	45	Coded	T	
23. TREATOP	I2	46-47	Coded	T	
24. INHIBPC	I2	48-49	Percent	T	
25. NONSTPC	I2	50-51	Percent	T	
26. GRSTKPC	I3	52-54	Percent	T	
27. ALSTKPC	I3	55-57	Percent	T	
28. REMPER	F3.1	58-60	Years	A	
29. EXPACR	I5	61-65	Acres	A	
30. EXPVOL	I5	66-70	Acres	A	
31. EXPGRO	I5	71-75	Acres	A	
32. EXPMOR	I5	76-80	Acres	A	
33. EXPREM	I5	81-85	Acres	A	
34. LONG	F7.1	86-92	Seconds	A	
35. LAT	F7.1	93-99	Seconds	A	
36. MDATE	I4	100-103	Year-month	A	

1 A = Recorded on all plots; F = Recorded on all forested plots (GLUCUR or GLUOLD = 20, 25, 40, or 45); T = Recorded on all timberland plots (GLUCUR or GLUOLD = 20). An item will be zero for plots where the element has not been recorded.

1. RECTYPE (coded) Record type—Record type 20 contains information that identifies and describes the plot. There is one record type

I2 20 for each plot in an EWDB file.
Col. 1-2

2. STATE State code—The two-digit Bureau of the Census, Federal
(coded) Information Processing Standards (FIPS) code number of the
I2 State. For States in the EWDB, these codes are:
Col. 3-4

01 Alabama	24 Maryland	40 Oklahoma
05 Arkansas	25 Massachusetts	42 Pennsylvania
09 Connecticut	26 Michigan	44 Rhode Island
10 Delaware	27 Minnesota	45 South Carolina
12 Florida	28 Mississippi	46 South Dakota
13 Georgia	29 Missouri	47 Tennessee
17 Illinois	31 Nebraska	48 Texas
18 Indiana	33 New Hampshire	50 Vermont
19 Iowa	34 New Jersey	51 Virginia
20 Kansas	36 New York	54 West Virginia
21 Kentucky	37 North Carolina	55 Wisconsin
22 Louisiana	38 North Dakota	72 Puerto Rico
23 Maine	39 Ohio	

3. UNIT Survey unit number—Forest Inventory and Analysis survey
(coded) unit identification number. Survey units are groups of
I1 counties within each State. See Appendix 2 for codes.
Col. 5

4. COUNTY County code—The three-digit FIPS code number for each
(coded) county, parish, or other similar governmental unit in a State.
I3 FIPS codes from the Bureau of the Census, 1980, are used.
Col. 6-8

5. PLTNUM Plot number—A four-digit plot number. Plot numbers are
(coded) unique within counties, but may be repeated within a
I4 State or survey unit.
Col. 9-12

6. OWNER Ownership code—Legal owner of the plot land at the time
(coded) of the current inventory. In addition, this code indicates if
I2 private lands have been leased to forest industry.
Col. 13-14

Code	Owner	Definition
11	National Forest	Lands owned or administered by USDA Forest Service, National Forest System.
12	Bureau of Land Management (BLM)	Lands owned or administered by USDI Bureau of Land Management
13	Indian Lands	Tribal lands held in fee by the Federal Government but administered for Indian tribal groups, and Indian trust allotments. (Indian lands not administered by the BIA are placed in the appropriate private owner class.)
14	Other Federal	Lands owned or administered by Federal agencies other than the Forest Service or the BLM. These include military reservations, National Parks, National Fish and Wildlife Service lands, and Corps of Engineers lands.
15	State	Lands owned by State governments, or lands leased by

State governmental units for more than 50 years.

16 County and Municipal — Lands owned by county or municipal agencies, or lands leased by these agencies for more than 50 years.

20 Forest Industry — Lands owned by companies or individuals operating wood-using plants.

40 Farmer — Lands owned by an individual who operates a farm (farm operator), either participating in the work or directly supervising the work. A farm is defined as land on which agricultural operations are being conducted and sale of agricultural products totals $1,000 or more during the year.

50 Farmer Owned-Leased — Lands owned by a farm operator but leased to forest industry.

60 Other Private-Corporate — Lands owned by private corporations other than forest industry or farmers.

70 Other Private-Individual — Lands owned by individuals other than farmers.

80 Other Private-Corporate—Leased — Lands owned by corporations but leased to forest industry

90 Other Private-Individual—Leased — Lands owned by other private individuals but leased to forest industry.

If lease status is unknown, the owner codes for unleased (40, 60, 70) are recorded.
If corporate status is unknown, the owner codes for individual are recorded (70, 90).

7. TYPCUR (coded) I2 Col. 15-16 — Current forest type—The predominant forest type of the area where the plot is located. This type is based on the tree species that form a plurality of all live stocking within the stand. In this two-digit coded element, the first digit represents a general type group and the second digit specifies an Eastwide standard type, as shown below. These types come from the standard set of local forest types in the Forest Service Handbook, with several types added. Not every type is recognized in every State, and type names used in published reports may differ from State to State. For example,the 1986 Indiana report shows area in a type called lowland oak. In the data base, the plots that represent this area are coded 61—swamp chestnut oak-cherrybark oak. The assignment of a forest type to a stand depends on the determination of stocking. Each FIA project has somewhat different methods of assigning stocking. Information on how data are assigned to these types for a particular State can be obtained directly

from the FIA project responsible for the inventory and from the following publications or people:

North Central:
Hansen and Hahn, 1992
Northeastern:
Contact Thomas Frieswyk, Northeastern Forest Experiment Station
Southeastern:
Contact Joseph F. Glover, Southeastern Forest Experiment Station
Southern:
May 1991

Type group	Forest type	Type group or forest type name

00		White - Red - Jack Pine
	01	Jack pine
	02	Red pine
	03	White pine
	04	White pine - hemlock
	05	Hemlock
	06	Scotch pine
	07	Ponderosa pine
10		Spruce - Fir
	11	Balsam fir
	12	Black spruce
	13	Red spruce - balsam fir
	14	Northern white-cedar
	15	Tamarack
	16	White spruce
	17	Norway spruce
	18	Larch
	19	Red spruce
20		Longleaf - Slash Pine
	21	Longleaf pine
	22	Slash pine
30		Loblolly - Shortleaf Pine
	31	Loblolly pine
	32	Shortleaf pine
	33	Virginia pine
	34	Sand pine
	35	Eastern redcedar
	36	Pond pine
	37	Spruce pine
	38	Pitch pine
	39	Table-mountain pine
40		Oak - Pine
	41	White pine - northern red oak - wash
	42	Eastern redcedar - hardwood
	43	Longleaf pine - scrub oak
	44	Shortleaf pine - oak
	45	Virginia pine - southern red oak
	46	Loblolly pine - hardwood
	47	Slash pine - hardwood
	49	Other oak - pine
50		Oak - Hickory
	51	Post oak - black oak - bear oak
	52	Chestnut oak
	53	White oak - red oak - hickory
	54	White oak
	55	Northern red oak
	56	Yellow-poplar - white oak - northern red oak
	57	Southern scrub oak
	58	Sweetgum - yellow-poplar
	59	Mixed central hardwoods
60		Oak - Gum - Cypress
	61	Swamp chestnut oak - cherrybark oak
	62	Sweetgum - Nuttall oak - willow oak
	63	Sugarberry - American elm - green ash
	65	Overcup oak - water hickory

	66	Atlantic white cedar
	67	Baldcypress - water tupelo
	68	Sweetbay - swamp tupelo - red maple
	69	Palm-mangrove - other tropical
70		Elm - Ash - Cottonwood
	71	Black ash - American elm - red maple
	72	River birch - sycamore
	73	Cottonwood
	74	Willow
	75	Sycamore - pecan - American elm
	76	Red maple - lowland
	79	Mixed lowland hardwoods
80		Maple - Beech - Birch
	81	Sugar maple - beech - yellow birch
	82	Black cherry
	83	Black walnut
	84	Red maple - northern hardwood
	87	Red maple - upland
	88	Northern hardwood - reverting field
	89	Mixed northern hardwoods
90		Aspen - Birch
	91	Aspen
	92	Paper birch
	93	Gray birch
	94	Balsam poplar
99	99	Nonstocked

8. TYPOLD (coded) I2 Col. 17-18 — Old forest type—Forest type at the previous survey. Criteria for assigning types and codes are the same as for TYPCUR. TYPOLD is zero for new or temporary plots.

9. STDAGE (years) I3 Col. 19-21 — Stand age—The age (in years) of the stand the plot is in. If actual age is unavailable or the stand has a mix of ages, 999 is entered. Any inventory dated 1983 or later will contain stand ages recorded to the nearest year. For some older inventories, stand age was recorded in 10- or 20-year age classes and the value recorded is the center of the age class.

10. STDSIZE (Coded) I1 Col. 22 — Stand size class—A classification of forest land based on the predominant stocking by the size of all live trees present on the plot. The d.b.h. range for poletimber trees is from 5.0 to 8.9 inches for softwoods and from 5.0 to 10.9 inches for hardwoods. Sawtimber trees are 9 inches d.b.h. or larger for softwoods and 11 inches d.b.h. or larger for hardwoods. Seedling and sapling trees are smaller than 5 inches d.b.h. Stand size class is determined by the percent stocking represented by various size trees. More detailed information on how stand size class is determined from plot data in a particular State can be obtained directly from the FIA project responsible for the inventory and from the following publications or people:

North Central:
Hansen and Hahn 1992
Northeastern:
Contact Thomas Frieswyk, Northeastern Forest Experiment Station

Southeastern:
Contact Joseph F. Glover, Southeastern Forest Experiment Station
Southern:
May 1991

Code	Stand size class	Definition
1	Sawtimber	Stands with an all live stocking value of at least 16.7 on which more than 50 percent of the stocking is in trees 5 inches d.b.h. or larger, and the stocking of sawtimber size trees is equal to or greater than the stocking of poletimber size trees.
2	Poletimber	Stands with an all live stocking value of at least 16.7 on which more than 50 percent of the stocking is in trees 5 inches d.b.h. or larger, and the stocking of sawtimber size trees is less than the stocking of poletimber size trees.
3	Seedling-sapling	Stands with an all live stocking value of at least 16.7 on which at least 50 percent of the stocking is in trees less than 5 inches d.b.h.
4	Non-stocked	Stands with an all live stocking value of less than 16.7.

11. STORCUR (coded) I1 Col. 23 — Current stand origin—The origin of the stand in which the plot is located (planted or natural). In a planted stand, most of the trees that define the stand size class and forest type must have originated from planting or direct artificial seeding.

Code	Current stand origin
1	Natural stands
2	Planted stands

12. STOROLD (coded) I1 Col. 24 — Old stand origin—Same as STORCUR at the time of the last inventory. STOROLD is zero for new or temporary plots.

Code	Current stand origin
1	Natural stands
2	Planted stands

13. SITECL (coded) I1 Col. 25 — Site productivity class—A classification of timber land in terms of inherent capacity to grow crops of industrial wood. The class identifies the average potential growth in cubic feet/acre/year (trees 5 inches d.b.h. or larger to a 4-inch top) and is based on the culmination of mean annual increment of fully stocked natural stands.

Code	Site productivity class
1	225+ cubic feet/acre/year

2	165-224 cubic feet/acre/year
3	120-164 cubic feet/acre/year
4	85-119 cubic feet/acre/year
5	50-84 cubic feet/acre/year
6	20-49 cubic feet/acre/year

14. SI (feet) I2 Col. 26-27 — Site index—Site index (in feet) of the stand in which the plot is located. A site index of 100 or more is recorded as 99.

15. SIAGE (years) I2 Col. 28-29 — Site index base age—The base age of the site index curves used to get Site index.

16. ADFOR (coded) I3 Col. 30-32 — Administrative forest—A three-digit code for the National Forest that the plot is located on. Present for National Forest plots only (owner=11), zero for all other owners.

Region	Code	National Forest name
1	108	Custer
2	203	Black Hills
2	207	Nebraska
8	801	NFS in Alabama
8	802	Daniel Boone
8	803	Chattahoochee-Oconee
8	804	Cherokee
8	805	NFS in Florida
8	806	Kisatchie
8	807	NFS in Mississippi
8	808	George Washington
8	809	Ouachita
8	810	Ozark and St. Francis
8	811	NFS in North Carolina
8	812	Francis Marion-Sumter
8	813	NFS in Texas
8	814	Jefferson
8	816	Caribbean
9	902	Chequamegon
9	903	Chippewa
9	904	Huron-Manistee
9	905	Mark Twain
9	906	Nicolet
9	907	Ottawa
9	909	Superior
9	910	Hiawatha
9	911	Wayne-Hoosier
9	919	Allegheny
9	920	Green Mountain
9	921	Monongahela
9	922	White Mountain

17. GLUCUR — Current land use class—A classification that indicates the

(coded) basic biological potential of the land and its current use and
I2 legal status. Initially, land is broken into two broad classes
Col. 33-34 (forest and nonforest). These broad classes are separated into the more specific classes that are actually coded.

Code	Current land use class
20	Timberland
25	Reserved Timberland
40	Other Forest Land
45	Reserved Other Forest Land
60	Nonforest Land
91	Census Water

Land class	Definition
Forest Land	Land currently growing forest trees of any size with a total stocking value of at least 16.7 (see element 27: ALSTKP for the definition of stocking), or lands formerly forested, currently capable of becoming forest land, and not currently developed for nonforest uses. These lands must be a minimum of 1 acre in area. Roadside, streamside, and shelterbelt strips of timber must have a crown width of at least 120 feet to qualify as forest land. Unimproved roads, trails, streams, and clearings within forest areas are classified as forest land if they are less than 120 feet wide. Recently clearcut areas that are currently nonstocked are classed as forest land unless they are being used for a nonforest use such as agriculture. Forest land is divided into two categories (timberland and other forest land), and both of these categories may be further classified as reserved if harvesting of trees is prohibited by statutory or administrative restrictions.
Timberland	Forest land that is producing or capable of producing crops of industrial wood. This land should be capable of producing 20 cubic feet of industrial wood per acre per year. Thisincludes all land formerly called commercial forest land.
Other Forest Land	Forest land not capable of producing crops of industrial wood. This may be the result of adverse site conditions such as sterile soils, dry climate, poor drainage, high elevation, and rockiness. Trees on these sites are usually of poor form, small size, or inferior quality and consequently are not used for industrial products. These sites often contain tree species that are not currently used for industrial wood production. (These lands were called unproductive forest in previous reports.)
Reserved Forest Land	Forest lands that have statutory or administrative restrictions prohibiting the harvest of trees. Examples include land within the National Wilderness Preservation System, Research Natural Areas, National Parks and Monuments, and State Parks. In National Forests, reserved forest lands are referred to collectively as withdrawn forest land. This

classification of reserved can be given to either timberland or other forest land.

Nonforest Land — Land that has never supported forests or land formerly forested but now developed for uses such as agriculture, residence, commerce, industry, city parks, or improved roads. If located within forest areas, unimproved roads and nonforested strips must be more than 120 feet wide, and clearings and other openings in a forest area must be more than 1 acre to qualify as nonforest land. Nonforest land also includes streams, sloughs, estuaries, and canals more than 120 feet wide but less than one-eighth of a mile (660 feet) wide, or lakes, reservoirs, and ponds 1 to 40 acres in size.

Census Water — Streams, sloughs, estuaries, and canals more than one-eighth of a statute mile (660 feet) wide, and lakes, reservoirs, and ponds more than 40 acres in size.

18. GLUOLD (coded) — Old land use class—Same as GLUCUR at the time of the last inventory. GLUOLD is zero for new or temporary plots.
I2
Col. 35-36

Code	Old land use class
20	Timberland
25	Reserved Timberland
40	Other Forest Land
45	Reserved Other Forest Land
60	Nonforest Land
91	Census Water

19. BA (sq. ft.) — Basal area—The summed-cross sectional area at breast height of all live trees 1.0 inches d.b.h. or larger on the plot. This item is usually measured by variable radius plot (prism) sampling and recorded in square feet per acre.
I3
Col. 37-39

20. SLOPE (percent) — Slope—The average percentage of the deviation from the horizontal over the sample acre. Valid values are 0 through 99.
I2
Col. 40-41

21. ASPECT (degrees) — Aspect—The direction of drainage for most of the plot, recorded as the azimuth of this direction. Valid values are 0 through 360. 0 is only valid when slope is also 0.
I3
Col. 42-44

22. PHYSIO (coded) — Physiographic class—A measure of soil and water conditions that affect tree growth on the plot.
I1
Col. 45

Code	Physiographic class	Definition
3	Xeric	Very dry soils where excessive drainage seriously limits both growth and species occurrence.

4	Xeromesic	Moderately dry soils where excessive drainage limits growth and species occurrence to some extent.
5	Mesic	Deep, well-drained soils. Growth and species occurrence limited only by climate.
6	Hydromesic	Moderately wet soils where insufficient drainage or infrequent flooding limits growth and species occurrence to some extent.
7	Hydric	Very wet sites where excess water seriously limits both growth and species occurrence.

23. TREATOP (coded) I2 Col. 46-47 Treatment opportunity class—Identifies the physical opportunity to improve stand conditions by applying management practices. The 11 classes are defined as follows:

Code	Treatment opportunity class	Definition
1	Regeneration without site preparation	The area is characterized by the absence of a manageable stand because of inadequate stocking of growing stock. Growth will be much below the potential for the site if the area is left alone. Prospects are not good for natural regeneration. Artificial regeneration will require little or no site preparation.
2	Regeneration with site preparation	The area is characterized by the absence of a manageable stand because of inadequate stocking of growing stock. Growth will be much below the potential for the site if the area is left alone. Either natural or artificial regeneration will equire site preparation.
3	Stand conversion	The area is characterized by stands of undesirable, chronically diseased, or off-site species. Growth and quality will be much below the potential for the site if the area is left alone. The best prospect is for conversion to a different forest type or species.
4	Thinning seedlings and saplings	The stand is characterized by a dense stocking of growing stock. Stagnation appears likely if left alone. Stocking must be reduced to help crop trees attain dominance.
5	Thinning poletimber	The stand is characterized by a dense stocking of growing stock. Stocking must be reduced to prevent stagnation or to confine growth to selected, high quality crop trees.
6	Other stocking control	The stand is characterized by an adequate stocking of seedlings, saplings, and/or poletimber growing stock, mixed with competing vegetation either overtopping or otherwise inhibiting the development of crop trees. The undesirable material must be removed to release overtopped trees; to

prevent stagnation; or to improve composition, form, or growth of the residual stand.

7	Other intermediate treatments	The stand would benefit from other special treatments such as fertilization to improve the growth potential of the site, and pruning to improve the quality of individual crop trees.
8	Clearcut harvest	The area is characterized by a mature or overmature sawtimber stand of sufficient volume to justify a commercial harvest. The best prospect is to harvest the stand and regenerate.
9	Partial cut harvest	The stand is characterized by poletimber or sawtimber size trees with sufficient merchantable volume for a commercial harvest, which will meet intermediate stand treatment needs or prepare the stand for natural regeneration. The stand is of a favored species composition and may be even or uneven aged. Included are such treatments as commercial thinning, seed tree or shelterwood regeneration, and use of the selection system to maintain an uneven age stand.
10	Salvage harvest	The stand is characterized by excessive damage to merchantable timber because of fire, insects, disease, wind, ice, or other destructive agents. The best prospect is to remove damaged or threatened material.
11	No treatment	Stand is characterized by an adequate stock of growing-stock trees in reasonably good condition.

24. INHIBPC (percent) I2 Col. 48-49 — Percent inhibiting vegetation—Percent of the area covered by inhibiting vegetation. A value of 99 is recorded for areas that are entirely (100 percent) covered with inhibiting vegetation. This item is not available for States inventoried by the Northeastern Forest Experiment Station.

25. NONSTPC (percent) I2 Col. 50-51 — Percent nonstocked—Percent of the area in which the plot is located that is nonstocked with all live trees (0-100 percent basis). A value of 99 is recorded for plots that have no live stocking (100 percent nonstocked). This item is not available for States inventoried by the Northeastern Forest Experiment Station.

26. GRSTKPC (value) I3 Col. 52-54 — Growing stock stocking—Stocking of the plot by growing-stock trees. Data are in the form of an absolute stocking value (0-167). More detailed information on how stocking values are determined from plot data in a particular State can be obtained directly from the FIA project responsible for the inventory and from the following publications or people:

North Central:
Hansen and Hahn 1992
Northeastern:
Contact Thomas Frieswyk, Northeastern Forest Experiment Station
Southeastern:
Contact Joseph F. Glover, Southeastern Forest Experiment Station
Southern:
May 1991

27. ALSTKPC (value) — All live stocking—Stocking of the plot by live trees of any species. Data are in the form of absolute stocking value (0-167). See element 26,

I3 GRSTKPC, for a list of publications that describe how stocking values are
Col. 55-57 determined from plot data. The following classification of plots based on the stocking value (all live and/or growing stock) is common in FIA reports.

Overstocked Stands in which stocking of all live trees is 130.0 or more.
Fully stocked Stands in which stocking of all live trees is from 100.0 to 129.9.
Medium stocked Stands in which stocking of all live trees is from 60.0 to 99.9.
Poorly stocked Stands in which stocking of all live trees is from 16.7 to 59.9.
Nonstocked Stands in which stocking of all live trees is less than 16.7.

28. REMPER (years) F3.1 Col. 58-60 Remeasurement period—The number of years between measurements of remeasured plots. This item is zero for new or temporary plots. Remeasurement period is based on the number of growing seasons between measurements. Allocation of parts of the growing season by month is different for each FIA project. Contact the individual FIA project for information on how this is done for a particular State.

29. EXPACR (acres) I5 Col. 61-65 Area expansion factor—The number of acres the plot represents for estimating area variables such as ownership and land cover class. The sum of EXPACR over all record 20's in a file is the total land and water area of the State.

30. EXPVOL (acres) I5 Col. 66-70 Volume expansion factor—The number of acres that the plot represents for estimating current volume and number of trees. Volume will be "expanded" over the appropriate acreage by multiplying EXPVOL x each volume/acre element on the tree record (record type 30). Total volume in a State is calculated by summing the expanded volume estimates from all trees on all plots in an EWDB file. Number of trees is expanded in a similar way.

31. EXPGRO (acres) I5 Col. 71-75 Growth expansion factor—The number of acres that the plot represents for estimating growth. Growth will be "expanded" over the appropriate acreage by multiplying EXPGRO x each growth/acre element on the tree record (record type 30). Total growth in a State is calculated by summing these expanded estimates from all trees on all plots in an EWDB file. Some plots will not have a value in this field. In some State inventories, growth is only estimated on remeasured plots. In such cases, this item would be zero for new or temporary plots.

32. EXPMOR (acres) I5 Col. 76-80 Mortality expansion factor—The number of acres that the plot represents for estimating mortality. Mortality will be "expanded" over the appropriate acreage by multiplying EXPMOR x each mortality/acre element on the tree record (record type 30). Total mortality in a State is calculated by summing these expanded estimates from all trees on all plots in an EWDB file. Some plots will not have a value in this field. In some State inventories, mortality is only estimated on remeasured plots. In such cases, this item would be zero for new or temporary plots.

33. EXPREM (acres) I5 Col. 81-85 Removals expansion factor—The number of acres that the plot represents for estimating removals. Removals will be "expanded" over the appropriate acreage by multiplying EXPREM x each removals/acre element on the tree record (record type 30). Total removals in a State is calculated by summing these expanded estimates from all trees on all plots in an EWDB file. Some

plots will not have a non-zero value in this field. In some State inventories, removals are only estimated on remeasured plots. In such cases, this item would be zero for new or temporary plots.

34. LONG (seconds) F7.1 Col. 86-92 — Longitude—The longitude of the plot recorded to the nearest 100 seconds.

35. LAT (seconds) F7.1 Col. 93-99 — Latitude—The latitude of the plot recorded to the nearest 100 seconds.

36. MDATE (date) I4 Col. 100-103 — Measurement date—The date the plot was actually measured. This date is coded YYMM where YY is the last 2 digits of the year (88 for 1988) and MM is the month (02 for February). This date may differ from DATE on the county record.

Record type 30

Table 3.—Record type 30, tree record

Element name	FORTRAN read format	Columns occupied	Units of measure	Key data items
1. RECTYPE	I2	1-2	Coded	
2. STATE	I2	3-4	Coded	X
3. UNIT	I1	5	Coded	
4. COUNTY	I3	6-8	Coded	X
5. PLTNUM	I4	9-12	Coded	X
6. POINT	I2	13-14	Coded	X
7. TREE	I2	15-16	Number	X
8. STATUS	I1	17	Number	X
9. SPP	I3	18-20	Coded	
10. SPPGRP	I2	21-22	Coded	
11. DBHCUR	F3.1	23-25	Inches	
12. DBHOLD	F3.1	26-28	Inches	
13. TGRADE	I1	29	Coded	
14. TCLASS	I1	30	Coded	
15. CRATIO	I1	31	Coded	
16. CRCLS	I1	32	Coded	
17. DAMAGE	I2	33-34	Coded	
18. VOLFAC	F8.4	35-42	Trees/acre	
19. MORTFAC	F8.4	43-50	Trees/acre/year	
20. REMVFAC	F8.4	51-58	Trees/acre/year	
21. NETCFVL	F8.4	59-66	Cubic feet	
22. NETCFSL	F8.4	67-74	Cubic feet	
23. NETBFVL	F8.4	75-82	Board feet	
24. NETCFGR	F8.4	83-90	Cu.ft./year	

25. NETBFGR F8.4 91-98 Bd.ft./year
26. TOTBIO I6 99-104 Green lbs.
27. MERBIO I6 105-110 Green lbs.

1. RECTYPE (coded) I2 Col. 1-2
Record type—Record type 30 contains information that identifies and describes each tree on a plot. Tree records will only occur on plots where either GLUCUR or GLUOLD on the plot record is 20 (Timberland).

2. STATE (coded) I2 Col. 3-4
State code—The two-digit Bureau of the Census, Federal Information Processing Standards (FIPS) code number of the State. For States in the EWDB, these codes are:

01	Alabama	24	Maryland	40	Oklahoma
05	Arkansas	25	Massachusetts	42	Pennsylvania
09	Connecticut	26	Michigan	44	Rhode Island
10	Delaware	27	Minnesota	45	South Carolina
12	Florida	28	Mississippi	46	South Dakota
13	Georgia	29	Missouri	47	Tennessee
17	Illinois	31	Nebraska	48	Texas
18	Indiana	33	New Hampshire	50	Vermont
19	Iowa	34	New Jersey	51	Virginia
20	Kansas	36	New York	54	West Virginia
21	Kentucky	37	North Carolina	55	Wisconsin
22	Louisiana	38	North Dakota	72	Puerto Rico
23	Maine	39	Ohio		

3. UNIT (coded) I1 Col. 5
Survey unit number—Forest Inventory and Analysis survey unit identification number. Survey units are groups of counties within each State. See Appendix 2 for codes.

4. COUNTY (coded) I3 Col. 6-8
County code—The three-digit FIPS code number for each county, parish or other similar governmental unit in a State. FIPS codes from the Bureau of the Census, 1980, are used.

5. PLTNUM (coded) I4 Col. 9-12
Plot number—A four-digit plot number. Plot numbers are unique within counties, but may be repeated within a State or survey unit.

6. POINT (number) I2 Col. 13-14
Point number—A two-digit point number used to identify the point (of the sample cluster) the tree was measured on.

7. TREE (number) I2 Col. 15-16
Tree number—A two-digit number used in combination with status to uniquely identify a tree on a point.

8. STATUS (coded)
Tree status—A one-digit code that identifies whether the sample tree is live, cut, or dead.

I1
Col. 17

Code	Tree status
1	Live
2	Dead (not salvageable)
3	Cut
4	Salvageable dead
5	Snag (special code for wildlife den trees used only by the Northeastern FIA project)

9. SPP (coded) — Species code—A three-digit standard tree species code. Codes for trees in the EWDB are listed in Appendix 3.
I3
Col. 18-20

10. SPPGRP (coded) — Species group—A two-digit Eastwide species group number. This number is used to produce many of the core tables. The assignment of individual species (SPP) to these groups is shown in Appendix 3. Individual FIA projects may further break these species groups down for published tables, but this is a common list that all published core tables must match. For example, the North Central FIA project routinely separates the eastern white and red pine group into two groups for publication in Minnesota, Wisconsin, and Michigan. But FIA projects cannot combine species groups in the core tables. For example, SPPGRP 26 and 27 cannot be combined in tables and reported as "other hardwoods."
I2
Col. 21-22

Code	Species group name
1	Longleaf and slash pine
2	Loblolly and shortleaf pine
3	Other yellow pines
4	Eastern white and red pine
5	Jack pine
6	Spruce and balsam fir
7	Eastern hemlock
8	Cypress
9	Other softwoods
10	Select white oaks
11	Select red oaks
12	Other white oaks
13	Other red oaks
14	Hickory
15	Yellow birch
16	Hard maple
17	Soft maple
18	Beech
19	Sweetgum
20	Tupelo and black gum
21	Ash
22	Cottonwood and aspen
23	Basswood
24	Yellow-poplar
25	Black walnut
26	Other soft hardwoods
27	Other hard hardwoods

28 Noncommercial

11. DBHCUR (inches) F3.1 Col. 23-25 Current diameter—The current diameter of the sample tree at breast height (in inches, to last one-tenth inch). For dead, salvageable dead, or snag trees (STATUS = 2, 4, or 5), this is the diameter of the tree at the time it died. In most cases the tree is still standing and the diameter is measured. If the bark has fallen off the tree, an estimated bark thickness is used to obtain this diameter so that it is an estimator of the diameter at the time the tree died. The Southeastern FIA project uses the diameter measured at the previous inventory and an update procedure to obtain the diameter at the time of death and other projects use a similar procedure for trees that can not be measured. For cut trees (STATUS = 3), the value in this item is somewhat different depending on the FIA project that produced the file. The Southern and Southeastern FIA projects estimate the d.b.h. of a cut tree at the time it was cut, and the Northeastern and North Central projects record this diameter as the diameter at the last measurement. The Southern project records this diameter as the diameter at the last measurement for trees on plots that change land use from timberland to other land uses.

12. DBHOLD (inches) F3.1 Col. 26-28 Old diameter—The diameter of the sample tree at breast height recorded at the previous measurement (in inches, to the last one-tenth inch).

13. TGRADE (coded) I1 Col. 29 Tree grade—This item is nonzero for all sawtimber size trees regardless of status. Tree grade is not measured on all sawtimber size trees on every plot. Sawtimber size trees that are graded but do not contain a gradeable log are given a tree grade 5. Sawtimber size trees that are not graded because of the sampling design have a tree grade of 9. Trees smaller than sawtimber receive a tree grade of zero. Procedures used to grade trees are different for each Eastern FIA project.

Code	Tree grade
1	Tree grade 1
2	Tree grade 2
3	Tree grade 3
4	Graded and contains a gradeable log but does not meet grade 3 standards
5	Graded but does not contain a gradeable log (local use trees)
9	Not graded

The following is a short discussion of each project's grading procedures. For more information, check with the individual FIA project.

North Central:

For hardwoods, the tree grade is based on Hanks, 1976. For softwoods, tree grade is the log grade of the first saw log in the tree. If a sawtimber-size tree does not have one 12-foot or two 8-foot saw logs that meet minimum log grade requirements, it is a cull tree (tree grade 5) and is also given a TCLASS other than 2. A growing-stock hardwood tree may also have a tree grade 5 if it does not have a gradeable 12-foot log in the first 16 feet, but does have at least one 12-foot or two 8-foot saw logs in the entire tree. Tree grade is only recorded on a subset of the sample plots in many States in the North Central

region. On plots where tree grade is not observed, all sawtimber-size trees are given a tree grade 9.

Northeastern:

For hardwoods and cypress, the tree grade is based on Hanks 1976. For yellow pines, the tree grade is based on Schroeder et al. 1968. For other softwoods, tree grade is based on Brisbin and Sonderman 1971.

Southeastern:

For hardwoods and cypress, the tree grade is based on Hanks 1976. For yellow pines, the tree grade is based on Schroeder et al. 1968. For other softwoods, tree grade is based on Brisbin and Sonderman 1971.

Southern:

Tree grades 1-3 for hardwoods and cypress are based on standards defined in Hanks 1976. Grade 4 is used for trees that do not qualify for grade 3, but that do contain a butt log that qualifies them for a tie and timber grade. Softwoods are assigned grades as described in USDA, Forest Service Handbook, 1972, Forest Survey Handbook (4809.11), Sections 46.8 and 75.1.

14. TCLASS (coded) I1 Col. 30 — Tree class—A one-digit code for the general quality of the tree. For cut, dead, and salvageable dead trees, TCLASS reflects conditions at the time the tree died or was cut. The following classes are represented:

Code	Tree class	Definition
2	Growing stock	All live trees of commercial species, except rough or rotten trees.
3	Rough cull	(a) Live trees of commercial species that do not contain at least one 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet regional specifications for freedom from defect primarily because of roughness or poor form, and (b) all trees of noncommercial species.
4	Rotten cull	Live trees of commercial species that do not contain at least one 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent (66 percent at the Southeastern Station) of the cull volume in a tree is rotten.

15. CRATIO (coded) I1 Col. 31 — Crown ratio—A one-digit code that indicates the percentage of the total tree height that supports a full, live, green, healthy foliage that is effectively contributing to tree growth. (Expressed as a percent of total tree height to the nearest 10 percent and recorded as a one-digit code for all trees 1 inch d.b.h. and larger).

Code	Crown ratio
1	0-9 percent
2	10-19 percent
3	20-29 percent
4	30-39 percent
5	40-49 percent
6	50-59 percent
7	60-69 percent
8	70-79 percent
9	80-99 percent

16. CRCLS (coded) I1 Col. 32 — Crown class—A one-digit code that primarily reflects the amount of sunlight received rather than the conventional "crown position" found in forestry textbooks. Recorded as a one-digit code for the following classes:

Code	Crown class	Definition
1	Open grown	Trees with crowns that have received full light from above and from all sides throughout all or most of their life, particularly during early development.
2	Dominant	Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the sides; larger than the average trees in the stand, and with crowns well developed, but possibly somewhat crowded on the sides.
3	Codominant	Trees with crowns forming part of the general level of the crown cover and receiving full light from above, but comparatively little from the side—usually with medium size crowns more or less crowded on the sides.
4	Intermediate	Trees shorter than those in the preceding two classes, but with crowns either below or extending into the crown cover formed by the dominant and codominant trees, receiving little direct light from above, and none from the sides; usually with small crowns very crowded on the sides.
5	Overtopped	Trees with crowns entirely below the general level of the crown cover and receiving no direct light either from above or the sides.

17. DAMAGE (coded) I2 Col. 33-34 — Damage—Damage is recorded for live trees if the presence of damage or pathogen activity is serious enough to reduce the quality or vigor of the tree. When a tree is damaged by more than one agent, the most severe damage is coded. When no damage is observed on a live tree, 00 is recorded. Damage recorded for dead trees is the cause of death. When the cause of death cannot be determined for a tree, 00 is recorded. Each FIA project records specific codes that may differ from one State to the next. These codes fall within the following ranges. For the specific codes used in a particular State, contact the FIA project responsible for that State.

Codes	Cause of damage
00	No damage or unknown cause of death
10-19	Insect
20-29	Disease
30-39	Fire
40-49	Animal
50-59	Weather
60-69	Suppression
70-79	Miscellaneous
80-89	Logging
90-99	Form

18. VOLFAC (trees/acre) F8.4 — Volume expansion factor—The number of trees per acre (current)that the tree record represents for calculating volume, biomass, number of trees, and growth. Per acre tree values are calculated by multiplying

Col. 35-42 VOLFAC x (NETCFVL, NETCFSL, NETBFVL, TOTBIO, MERBIO, NETCFGR, or NETBFGR) for each tree (record type 30). Totals are calculated by summing the product of per acre values and the appropriate area expander from record 20.

19. MORTFAC (trees/acre/yr) F8.4 Col. 43-50 Mortality expansion factor—The number of trees per acre per year that the tree record represents for calculating mortality. Mortality per acre is calculated by multiplying MORTFAC x (NETCFVL, NETCFSL, or NETBFVL) for each tree (record type 30). Total mortality is calculated by summing the product of per acre mortality and the appropriate area expander from record 20. This item is zero if the tree does not contribute to the mortality value.

20. REMVFAC (trees/acre/yr) F8.4 Col. 51-58 Removals expansion factor—The number of trees per acre per year that the tree record represents for calculating removals. Removals per acre are calculated by multiplying REMVFAC x (NETCFVL, NETCFSL, or NETBFVL) for each tree (record type 30). Total removals are calculated by summing the product of expanded per acre removals and the appropriate area expander from record 20. This field should be zero if the tree does not contribute to the removals value.

21. NETCFVL (cubic feet) F8.4 Col. 59-66 Net cubic foot volume—The net volume of wood in the central stem of a sample tree 5 inches d.b.h. or larger from a 1-foot-tall stump to a minimum 4-inch top d.o.b. or to where the central stem breaks into limbs all of which are less than 4 inches d.o.b. This is a per tree value and must be multiplied by one of the above expansion factors to obtain per acre information. Trees with DBHCUR less than 5 have zero in this field. All trees with DBHCUR 5 or larger (including dead, salvageable dead, and cut trees) have entries in this field.

22. NETCFSL (cubic feet) F8.4 Col. 67-74 Net cubic foot volume in the saw log—The net volume of wood in the central stem of a sample tree of sawtimber size (9 inches d.b.h. minimum for softwoods, 11 inches d.b.h. minimum for hardwoods) from a 1-foot stump to a minimum top d.o.b. (7 inches for softwoods, 9 inches for hardwoods) or to where the central stem breaks into limbs all of which are less than the minimum top d.o.b. This is a per tree value and must be multiplied by one of the above expansion factors to obtain per acre information. Trees with DBHCUR less than 9.0 (11.0 for hardwoods) should have zero in this field. All larger trees (including dead, salvageable dead, and cut trees) have entries in this field if they are growing-stock trees (TCLASS = 2). All rough and rotten trees (TCLASS = 3 or 4) have zero in this field.

23. NETBFVL (board feet) F8.4 Col. 75-82 Net board foot volume in the saw log—The net volume of wood in the central stem of a sample tree of sawtimber size (9 inches d.b.h. minimum for softwoods, 11 inches d.b.h. minimum for hardwoods) from a 1-foot stump to a minimum top d.o.b. (7 inches for softwoods, 9 inches for hardwoods) or to where the central stem breaks into limbs all of which are less than the minimum top d.o.b. Volume is based on International 1/4 inch scale. This is a per tree value and must be multiplied by one of the above expansion factors to obtain per acre information. Trees with DBHCUR less than 9 (11 for hardwoods) have zero in this field. All larger trees, including dead, salvageable dead, and cut trees, should have entries in this field if they are growing stock (TCLASS = 2). All rough and rotten trees (TCLASS = 3 or 4) have zero in this field.

Note: NETCFVL, NETCFSL, and NETBFVL are computed values. These volumes are all based on DBHCUR and therefore represent the volume at current inventory for live trees (STATUS = 1) and volume at the time the tree died for dead, salvageable dead, and snags (STATUS = 2, 4, or 5). For cut trees (STATUS = 3), see the differences in FIA methods presented in DBHCUR. Methods used to compute these volumes are given in the following publications:

North Central:
MN, WI, MI, ND, SD: Hahn 1984
IA, MO, NE, KS: Hahn and Hansen 1991
IL, IN: Smith and Weist 1982
Northeastern:
All States: Scott 1979, 1981
Southeastern:
All States: Cost 1978
Southern:
Current volumes are computed using Simalian's formula with measured merchantable heights and upper stem diameters following procedures described in Grosenbaugh 1964. Volumes for dead and cut trees are computed using regression equations developed by species groups in each survey (see Kelly and Beltz 1987). General information is also contained in selected State survey reports (Rosson et al. 1988, McWilliams and Lord 1988, Birdsey and May 1988, Kelly and Sims 1989).

24. NETCFGR (cu.ft./year) F8.4 Col. 83-90 — Net cubic foot growth—The net change in cubic foot volume per year that this tree represents. Because this value is net growth, it may be a negative number. Negative growth values are usually due to mortality but can also occur on live trees that have a net loss in volume because of damage, rot, or other causes. Net cubic foot growth on a per acre basis is computed by taking the product of this number and VOLFAC.

25. NETBFGR (bd.ft./year) F8.4 Col. 91-98 — Net board foot growth—The net change in board foot volume per year that this tree represents. This may be a negative number. Net board foot growth on a per acre basis is computed by taking the product of this number and VOLFAC.

26. TOTBIO (green lbs.) I6 Col. 99-104 — Total gross biomass—The total above-ground biomass of a sample tree 1 inch d.b.h. or larger, including all tops and limbs. This is a per tree value and must be multiplied by one of the above expansion factors to obtain per acre information. Recorded in green pounds per tree. This field should have an entry if DBHCUR is 1.0 or larger, regardless of status or TCLASS; zero otherwise.

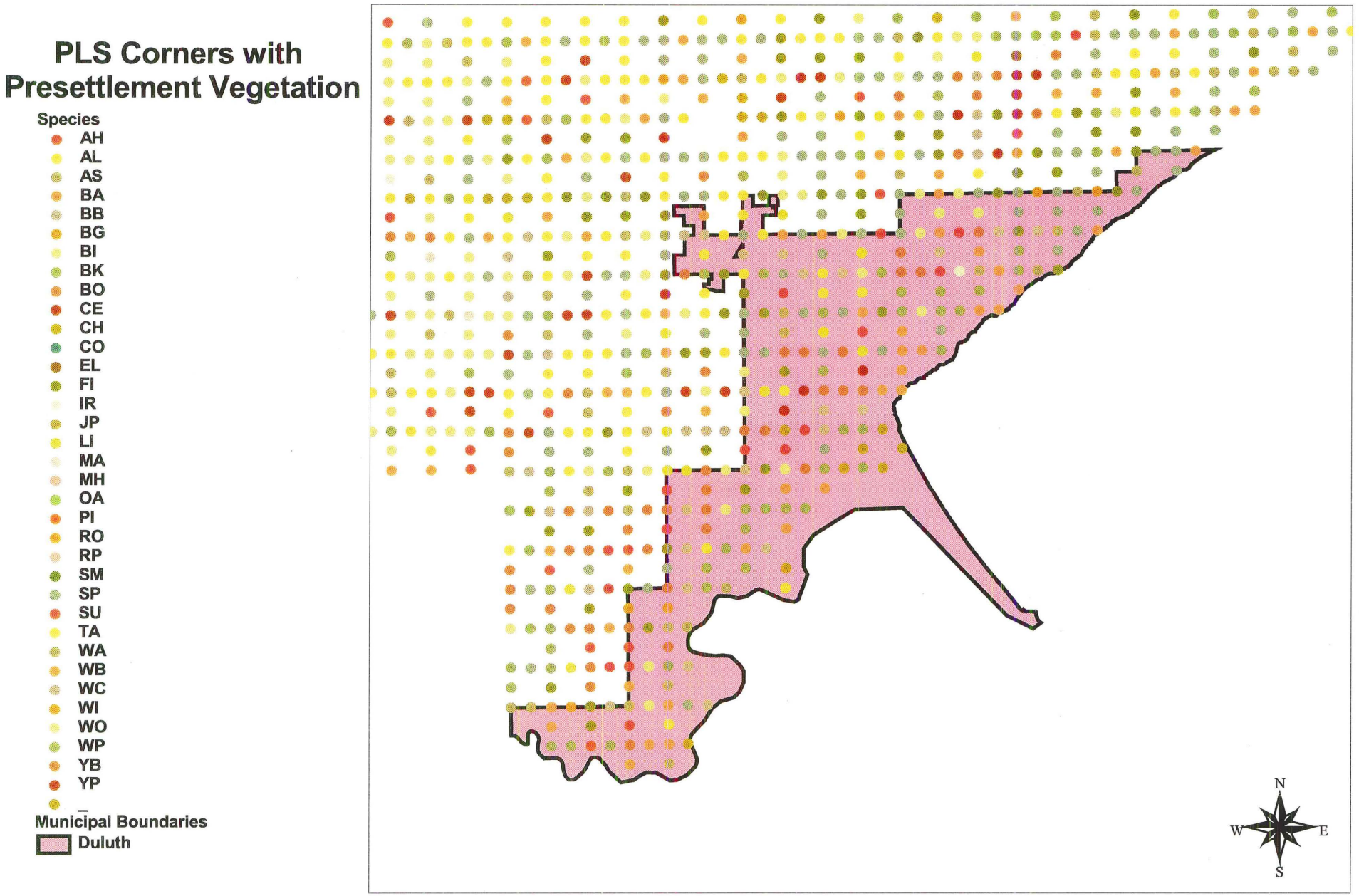
27. MERBIO (green lbs.) I6 Col. 105-110 — Merchantable biomass—The total gross biomass of a tree 5 inches d.b.h. or larger from a 1-foot stump to a minimum 4-inch top d.o.b. of the central stem. This is a per tree value and must be multiplied by one of the above expansion factors to obtain per acre information. This field should have an entry if DBHCUR is 5.0 or larger, regardless of status or TCLASS; zero otherwise. For dead or cut trees, this number represents their biomass at the time of death or last measurement.

Note: TOTBIO and MERBIO are computed values. These weights are all based on DBHCUR and therefore represent the weight at current inventory for live trees (STATUS = 1) and weight at the time the tree died for dead, salvageable dead, and snags (STATUS = 2, 4, or 5). For cut trees (STATUS =

3), see the differences in FIA methods presented in DBHCUR. Methods used to compute these biomasses are given in the following publications:

North central:
MN, WI, MI, ND, SD: Hahn 1984
IA, MO, NE, KS: Hahn and Hansen 1991
IL, IN: Smith and Weist 1982
Northeastern:
All States: Monteith 1979, Wiant et al. 1977
Southeastern:
All States: Cost and McClure 1982
Southern:
All States: Rosson 1989

PLS Corners with Presettlement Vegetation



- Lite Metadata - - Get Data - - View Attribute Table - - View Sample -

Minnesota DNR - Section of Wildlife - Minnesota County Biological Survey

PLS Corners with Presettlement Vegetation Information

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Go to Section:
1. Identification Information
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5. Entity and Attribute Information
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7. Metadata Reference Information

Section 1	*Identification Information - - - - - - top*
Originator	Minnesota DNR - Section of Wildlife - Minnesota County Biological Survey
Title	PLS Corners with Presettlement Vegetation Information
System Name	btvegpt3
Abstract	A point database storing information on vegetation type information and general location of bearing trees used in conjunction with the original Public Land Survey (PLS). This database contains the actual location of section corners, rather than the location of the bearing trees themselves. The data are derived from land surveyor notes, which include descriptions of vegetation and landscape characteristics along survey transects. This database is described in greater detail in the publication: Minnesta's Bearing Tree Database, by John Almendinger, Biological Report No. 56, Minnesota Department of Natural Resources, 1997.
Purpose	The data set is one source of information for scientists wishing to model environmental and ecological conditions present at the time of the original PLS survey.
Time Period of Content Date	1908
Currentness Reference	The data are derived from original survey notes that cover the period of 1846-1908.
Progress	Complete
Maintenance and Update Frequency	None
Spatial Extent of Data	Statewide
Bounding Coordinates	E = -89 W = -97.5 N = 49.5

	S = 43
Place Keywords	Minnesota
Theme Keywords	Presettlement Vegetation, Public Land Survey, PLS Sections
Theme Keyword Thesaurus	None
Access Constraints	None
Use Constraints	The data included here were provided by the Minnesota Natural Heritage Program and Nongame Research Program of the Divsion of Fish and Wildlife, Minnesota Department of Natural Resources (DNR). The DNR is not responsible for any inaccuracies in these data. Use of these data does not imply endorsement or approval by the DNR of any interpretations or products derived from the data.
Contact Person Information	Rich Baker, Information Systems Manager DNR-Section of Ecol 500 Lafayette Road, Box 25 St. Paul, MN 55155 Phone: (651) 297-3764 FAX: E-mail: rich.baker@dnr.state.mn.us
Browse Graphic File Name	btvegpt3_sam.gif
Browse Graphic File Description	
Associated Data Sets	The DNR data set: Bearing Tree Database has been derived from the same information sources as this data. While the Bearing Tree Database attempts to approximate the location of the original bearing trees. This data set simply records the observed composition of species and assigns that information to the PLS corner location itself.

Section 2	*Data Quality Information - - - - - - top*
Attribute Accuracy	The PLS Corners with Presettlement Vegetation Information data set is derived from a source (original land surveyor notes) which contains known deficiencies that impact the accuracy of attributes within the database. The purpose of the land srvey was land subdivision. The collection of information on tree species and vegetation community typing was an ancillary activity, and the accuracy of tree species and vegetation community typing is known to suffer as a result. DNR Biological Report 56 (refenced in the abstract to this description) provides essential information for understanding the source materials from which these data were derived.
Logical Consistency	Data are topolocially correct using ARC/INFO 7.0.4.
Completeness	Data are available statewide.
Horizontal Positional Accuracy	The Original Vegetation Around Bearing Trees data set uses section corner and half section corner locations from the Minnesota Control Point Inventory (CPI), which contains the most horizontally accurate positions for these types of features currently available. The accuracy of section and half-section locations within the database can be considered accurate to within +/- 50 feet.
Vertical Positional	Not Applicable

Accuracy	
Lineage	The data originate with hand-written notes prepared by field surveyor's during the 19th century land subdivision of Minnesota into PLS-referenced platts. Survey notes were systematically reviewed for the purpose of identifying bearing tree species as well as the characteristics of vegetative communities and landforms along survey lines. The information was compiled in a single tabular database, and various inadequacies and deficiencies in the data were noted. The tabular database was in turn georeferenced to a coordinate file of PLS section and half-section corners called GISMO (which is a predecessor of the currently alive and well Control Point Inventory)). The information from the source tabular database was then transferred to the attributes of the PLS point locations in ARC/INFO format.
Source Scale Denominator	24000

Section 3	*Spatial Data Organization Information - - - - - - top*
Native Data Set Environment	ARC/INFO Coverages
Geographic Reference for Tabular Data	Not Applicable
Spatial Object Type	Point
Vendor Specific Object Types	Points
Tiling Scheme	q100k

Section 4	*Spatial Reference Information - - - - - - top*
Horizontal Coordinate Scheme	UTM
Ellipsoid	GRS1980
Horizontal Datum	NAD83
Horizontal Units	meters
Distance Resolution	meters
Altitude Datum	n/a
Altitude Units	n/a
Depth Datum	n/a
Depth Units	n/a
Cell Width	0
Cell Height	0
Latitude Resolution	0
Longitude Resolution	0

UTM Zone Number	15
SPCS Zone Identifier	0
County Coordinate Zone Identifier	0
Coordinate Offsets or Adjustments	n/a
Map Projection Name	n/a
Map Projection Parameters	n/a
Other Coordinate System's Definition	n/a

Section 5 *Entity and Attribute Information - - - - - - top*

Entity and Attribute Overview: PLS Section and half-section corners attributized for general surrounding veg/terrain characteristics, and the type, diameter, and distance of up to four bearing trees associated with each corner.

Entity and Attribute Detailed Citation: Vegetation Around Bearing Trees

HTML Table

--btvegpt3.pat--
ID: Unique ID for the coverage/tile
X: UTM X coordinate in Minnesota shifted format
Y: UTM Y coordinate in Minnesota shifted format
TWP: Township (tier) number
RNG: Range Number
TIC: Standard survey corner number
VEGTYPE: General vegetation type around bearing tree
SPECIES1: First bearing tree species
DIAM1: First Bearing Tree diameter (inches)
DIR1: First Bearing Tree direction
DIST1: First Bearing Tree distance in links (7.92 inches)
SPECIES2: Second bearing tree species
DIAM2: Second Bearing Tree diameter (inches)
DIR2: Second Bearing Tree direction
DIST2: Second Bearing Tree distance in links (7.92 inches)
SPECIES2: Third bearing tree species
DIAM3: Third Bearing Tree diameter (inches)
DIR3: Third Bearing Tree direction
DIST3: Third Bearing Tree distance in links (7.92 inches)
SPECIES4: Fourth bearing tree species
DIAM4: Fourth Bearing Tree diameter (inches)
DIR4: Fourth Bearing Tree direction
DIST4: Fourth Bearing Tree distance in links (7.92 inches)

Section 6 *Distribution Information - - - - - - top*

Publisher	Minnesota DNR - MIS Bureau
Publication Date	6/9/1998

Contact Person Information	Robert Maki, GIS Database Coordinator Minnesota DNR 500 Lafayette Road, Box 11 St. Paul, MN 55155 Phone: (651) 297-2329 FAX: (651) 297-4946 E-mail: robert.maki@dnr.state.mn.us
Distributor's Data Set Identifier	btvegpt3
Distribution Liability	None stated
Transfer Format Name	7.1.2
Transfer Format Version Number	ARC/INFO
Transfer Size	32.6
Ordering Instructions	Contact above Person
Online Linkage	DNR Data Deli

Section 7	*Metadata Reference Information - - - - - - top*
Metadata Date	6/9/1998
Contact Person Information	Robert Maki, GIS Database Coordinator Minnesota DNR - MIS Bureau 500 Lafayette Road Saint Paul, MN 55155 Phone: (651) 297-2329 FAX: (651) 297-4946 E-mail: robert.maki@dnr.state.mn.us
Metadata Standard Name	Minnesota Geographic Metadata Guidelines
Metadata Standard Version	1.1
Metadata Standard Online Linkage	http://www.lmic.state.mn.us/gc/stds/metadata.htm

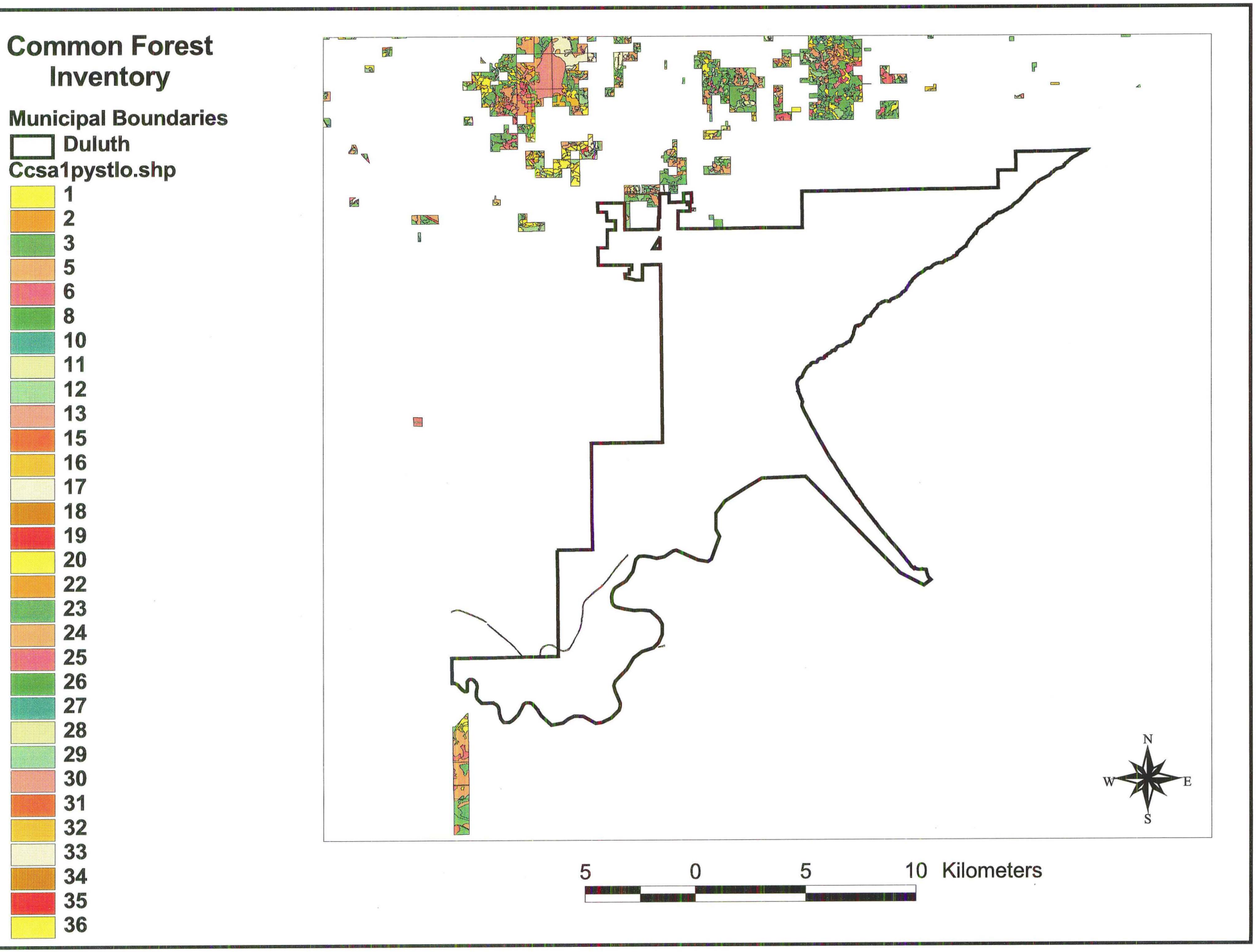
Vegetation Around Bearing Trees

Table Name	Field Name	Begin Column	Definition	Valid Values	Description
btvegpt3.pat					ARC/INFO Point Atrribute Table (PAT)
	ID	17	5, 5, I		Unique ID for the coverage/tile
	X	22	4, 12, F, 3		UTM X coordinate in Minnesota shifted format
	Y	26	4, 12, F, 3		UTM Y coordinate in Minnesota shifted format
	TWP	30	5, 5, C		Township (tier) number
	RNG	35	4, 4, C		Range Number
	TIC	39	3, 3, I		Standard survey corner number
	VEGTYPE	42	1, 1, C		General vegetation type around bearing tree
				A	creek
				B	oak barrens
				C	plowed field, field
				D	dry ridge
				E	meadow
				F	forest, timber
				G	grove
				H	bottom
				I	pine openings, pine barrens, scattered pine
				J	pine grove
				K	scattering oak, scattering timber
				L	lake, slough, pond
				M	marsh
				N	dry land
				O	oak openings
				P	prairie
				R	river
				S	swamp
				T	thicket, brush, underbrush
				U	burned area
				V	valley, ravine
				W	windthrow, windfall
				X	only tree around
				Y	island
				Z	wet prairie
				blank	no code recorded by collector

SPECIES1	43	2, 2, C		First bearing tree species
			AH	Ash--Fraxinus nigra, F. pennsylvanica, F. americana
			AL	Alder--Alnus incana, A. viridis
			AS	Aspen--Populus tremuloides, P. grandidentata, P. balsamifera (in lesser part)
			BA	Black Ash--Fraxinus nigra
			BB	Black Birch--Betula nigra, B. alleghaniensis (in part ?)
			BE	Beech--Fagus grandifolia (unknown from Minn. possibly Carpinus caroliniana
			BG	Balm-of-Gilead--Populus balsamifera (in greater part)
			BI	Birch--Betula papyrifera, B. cordifolia
			BK	Black Oak--Quercus nigra, Q. ellipsoidalis (in part)
			BL	Blue Beech--Carpinus caroliniana
			BO	Bur Oak--Quercus macrocarpa
			BP	Babswood--Tilia americana
			BS	Black Spruce--Picea mariana
			BT	Buttonwood--Platanus occidentalis (unknown from Minn. ?)
			BU	Butternut--Juglans cinerea
			BW	Black Walnut--Juglans nigra
			BX	Box-Elder--Acer negundo
			BY	Buckeye--Aesculus glabra (unknown from Minn. ?)
			CE	Cedar--Thuja occidentalis, rarely Juniperus virginiana
			CH	Cherry--Prunus serotina, P. pennsylvanica
			CO	Cottonwood--Populus deltoides
			CR	Crab-Apple--Crataegus spp.
			EL	Elm--Ulmus americana, U. rubra, U. thomasii
			FI	Fir--Abies balsamea
			HA	Hackberry--Celtis occidentalis
			HB	Hornbeam--Ostrya virginiana
			HI	Hickory--Carya cordiformis, C. ovata
			HT	Hawthorn--Crataegus spp.
			IR	Ironwood--Ostrya virginiana

JO	Jack Oak--Quercus ellipsoidalis
JP	Jack Pine--Pinus banksiana
JU	Juniper or Red Cedar--Juniperus virginiana
LI	Linden or Basswood--Tilia americana
MA	Maple--Acer rubrum, A. saccharum, A. saccharinum
MH	Mountain Ash--Sorbus decora, S. americana
MS	Mountain Spruce--probably Picea glauca
OA	Oak--Quercus rubra, Q. macrocarpa, Q. ellipsoidalis, Q. velutina, Q. alba, Q. bicolor
PI	Pine--Pinus strobus, P. resinosa, P. banksiana
PL	Plum--probably Prunus americana
PP	Pitch Pine--Pinus banksiana
PS	Spruce Pine--Pinus banksiana
RA	Red Ash--Fraxinus pennsylvanica
RE	Red Elm--Ulmus rubra
RM	Red Maple--Acer rubrum
RO	Red Oak --Quercus rubra, Q. ellipsoidalis (in part or as hybrid)
RP	Red, Norway, or Yellow Pine--Pinus resinosa
SM	Soft or White Maple--Acer rubrum or A. Saccharinum
SO	Spanish Oak--Quercus ellipsoidalis
SP	Spruce--Picea mariana, P. glauca
SU	Sugar Maple--Acer saccharum
TA	Tamarack--Larix laricina
TH	Thorn--probably Crataegus spp.
OU	Scrub Oak--predominantly Quercus ellipsoidalis , but includes Q. macrocarpa as well
UP	Burned Pine--Pinus spp.
WA	White Ash--Fraxinus americana, F. pennsylvanica (in part)
WB	White Birch--Betula papyrifera, B. cordifolia
WC	White Cedar--Thuja occidentalis
WE	Water Elm--Ulmus spp.
WH	Witch Hazel--Hamamelis virginiana

			WI	Willow--Salix spp.
			WO	White Oak--Quercus alba, Q. macrocarpa (in part)
			WP	White Pine--Pinus strobus
			WS	White Spruce--Picea glauca
			XX	Illegible or Not Recorded--equivalent unknown
			YB	Yellow Birch--Betula alleghaniensis
			YP	Yellow Pine--Pinus resinosa
DIAM1	45	4, 4, I		First Bearing Tree diameter (inches)
DIR1	49	4, 4, C		First Bearing Tree direction
DIST1	53	4, 4, C		First Bearing Tree distance in links (7.92 inches)
SPECIES2	57	2, 2, C		Second bearing tree species
			Same Domain as SPECIES1 field	
DIAM1	59	4, 4, I		Second Bearing Tree diameter (inches)
DIR1	63	4, 4, C		Second Bearing Tree direction
DIST1	67	4, 4, C		Second Bearing Tree distance in links (7.92 inches)
SPECIES3	71	2, 2, C		Third bearing tree species
			Same Domain as SPECIES1 field	
DIAM1	73	4, 4, I		Third Bearing Tree diameter (inches)
DIR1	77	4, 4, C		Third Bearing Tree direction
DIST1	81	4, 4, C		Third Bearing Tree distance in links (7.92 inches)
SPECIES4	85	2, 2, C		Fourth bearing tree species
			Same Domain as SPECIES1 field	
DIAM1	87	4, 4, I		Fourth Bearing Tree diameter (inches)
DIR1	91	4, 4, C		Fourth Bearing Tree direction
DIST1	95	4, 4, C		Fourth Bearing Tree distance in links (7.92 inches)


Common Forest Inventory
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- Lite Metadata - - Get Data - - View Attribute Table - - View Sample -

Minnesota Interagency Information Cooperative

Common Forest Inventory (CSA)

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metadata created using Minnesota Geographic Metadata Guidelines .

Go to Section:
1. Identification Information
2. Data Quality Information
3. Spatial Data Organization Information
4. Spatial Reference Information
5. Entity and Attribute Information
6. Distribution Information
7. Metadata Reference Information

Section 1	*Identification Information - - - - - - top*
Originator	Minnesota Interagency Information Cooperative
Title	Common Forest Inventory (CSA)
System Name	ccsa1rg3
Abstract	This ARC/INFO region coverage contains digital forest C.S.A. inventory data obtained from public agencies including the Minnesota Department of Natural Resources Divsion of Forestry, the Superior National Forest, and county land departments. The data describes individual forest stands that are manged by the agencies mentioned above. The data was originally photo-interpreted. Since then many stands have been field measured. Lastly each agency has translated their detailed data to this, more general, format. The common format contains the common elements found in the 3 public agencies (county, state, federal) CSA databases.
Purpose	To provide a more complete picture of Minnesota's public forest lands for management over ownership boundaries.
Time Period of Content Date	1998
Currentness Reference	Original data source depends on each agency. The date in 'time period of content' represents the year the data was converted to the IIC common format.
Progress	In Work
Maintenance and Update Frequency	Unknown
Spatial Extent of Data	CSA stands in St. Louis, Lake, and Cook Counties, MN. Additional counties are in preparation.
Bounding Coordinates	E = -89 W = -97.5 N = 49.5 S = 43

Place Keywords	Minnesota, Public Lands
Theme Keywords	Forest Inventory, Cooperative Stand Assessment, CSA, Interagency Information Cooperative, IIC, Common Format
Theme Keyword Thesaurus	none
Access Constraints	In order to obtain this data, all the terms listed in the file, iicdis.html, located at the online linkage page, must be ageed upon.
Use Constraints	In order to use this data, all the terms listed in the file, iiclic.txt, located at the online linkage page, must be ageed upon.
Contact Person Information	Chad Skally, GIS Specialist Minnesota DNR, Forestry Division 500 Lafayette Road, Box 4 St. Paul, MN 55155-4044 Phone: 651-296-0757 FAX: 651-296-5954 E-mail: chad.skally@dnr.state.mn.us
Browse Graphic File Name	ccsa1rg3_sam.gif
Browse Graphic File Description	
Associated Data Sets	Detailed forest inventory data (CSA) provided by the Minnesota Department of Natural Resources Divsion of Forestry, the Forest Service, and some Counties.

Section 2	*Data Quality Information* - - - - - - *top*
Attribute Accuracy	Refer to metadata from original CSA databases.
Logical Consistency	There are many errors in the location of township and forest stand boundaries, both between and within public agencies. This causes gaps and overlaps in polygons to occur between section and township lines.
Completeness	This CSA data has been translated from the MNDNR, Superior National Forest, and St.Loius county data.
Horizontal Positional Accuracy	Unknown
Vertical Positional Accuracy	Not Applicable
Lineage	Refer to metadata from original CSA databases.
Source Scale Denominator	15840

Section 3	*Spatial Data Organization Information* - - - - - - *top*
Native Data Set Environment	Arc/Info
Geographic Reference for Tabular Data	

Spatial Object Type	Vector
Vendor Specific Object Types	Regions
Tiling Scheme	County

Section 4	*Spatial Reference Information - - - - - - top*
Horizontal Coordinate Scheme	UTM
Ellipsoid	GRS1980
Horizontal Datum	NAD83
Horizontal Units	meters
Distance Resolution	meters
Altitude Datum	n/a
Altitude Units	n/a
Depth Datum	n/a
Depth Units	n/a
Cell Width	0
Cell Height	0
Latitude Resolution	0
Longitude Resolution	0
UTM Zone Number	15
SPCS Zone Identifier	0
County Coordinate Zone Identifier	0
Coordinate Offsets or Adjustments	n/a
Map Projection Name	n/a
Map Projection Parameters	n/a
Other Coordinate System's Definition	n/a

Section 5	*Entity and Attribute Information - - - - - - top*
Entity and Attribute Overview	Each polygon contains a stand-id which is a concatination of selected elements of the original CSA data, as chosen by the provider (public agency). The common format contains the following attributes for each stand Cover_Type: Forest cover type classification code. Cover_Size: Size class classification code based on DBH of trees. Stocking: Indication of growing space mostly based on

	sapling size and BA. Age: Age of the stand at the time the data was converted to the common format. Measure_Year: The year the stand data was collected. Site_Index: The site index as collected in each of the inventories. Site_Species: Site species used to measure the site index. Administrator: Agency who mangaes the stand. Recon_Level: How the stand data was collected (ground or photo). Stand_ID: The Administrators unique stand-id.
Entity and Attribute Detailed Citation	
HTML Table	

Section 6	*Distribution Information - - - - - - top*
Publisher	Minnesota Interagency Information Cooperative
Publication Date	
Contact Person Information	Chad Skally, GIS Specialist Minnesota DNR, Forestry Division 500 Lafayette Road, Box4 St. Paul, MN 55155-4044 Phone: 651-296-0757 FAX: 651-296-5954 E-mail: chad.skally@dnr.state.mn.us
Distributor's Data Set Identifier	ccsa1rg3
Distribution Liability	
Transfer Format Name	
Transfer Format Version Number	
Transfer Size	
Ordering Instructions	Visit www.deli.dnr.state.mn.us
Online Linkage	DNR Data Deli

Section 7	*Metadata Reference Information - - - - - - top*
Metadata Date	6/20/1999
Contact Person Information	Chad Skally, GIS Specialist Minnesota DNR - Division of Forestry 500 Lafayette Road, Box 4 St. Paul, MN 55155-4044 Phone: 651-296-0757 FAX: 651-296-5954 E-mail: chad.skally@dnr.state.mn.us
Metadata Standard Name	Minnesota Geographic Metadata Guidelines
Metadata Standard	1.2

Version

Metadata Standard Online Linkage http://www.lmic.state.mn.us/gc/stds/metadata.htm

Common Forest Inventory (CSA)

Table Name	Field Name	Begin Column	Definition	Valid Values	Description
ccsa1rg3.pat plus region subclass tables: ccsa1rg3.patccsaco ccsa1rg3.patccsafs ccsa1rg3.patccsast					ARC/INFO Regions Attribute Table. Coverage has 3 region subclasses: ccsaco for county CSA data, ccsafs for Forest Service CSA data, and ccsast for State DNR CSA data.
	area	1 - The begin column may be different depending on the region sublass	4,12,F		Area in meters squared.
	perimeter	13	4,12,F		Perimeter in meters.
	cover#	25	4,5,B		ARC/INFO internal number.
	cover-id	30	4,5,B		ARC/INFO unique polygon id number
	cover_type	35	3,3,I		Major forest type in the stand based on basal area or some derivative of basal area (i.e. volume).
				1	ash, willow, or lowland hardwood
				2	balm-of-Gilead (balsam polar hybrid)
				3	aspen, bigtooth, cottonwood, offsite aspen, or aspen-spruce-fir
				4	hybrid
				5	birch
				6	northern hardwood, mixed hardwood, sugar maple-basswood, or sugar maple
				7	central hardwoods
				8	oak, bur oak, or northen red oak
				9	walnut
				10	white pine

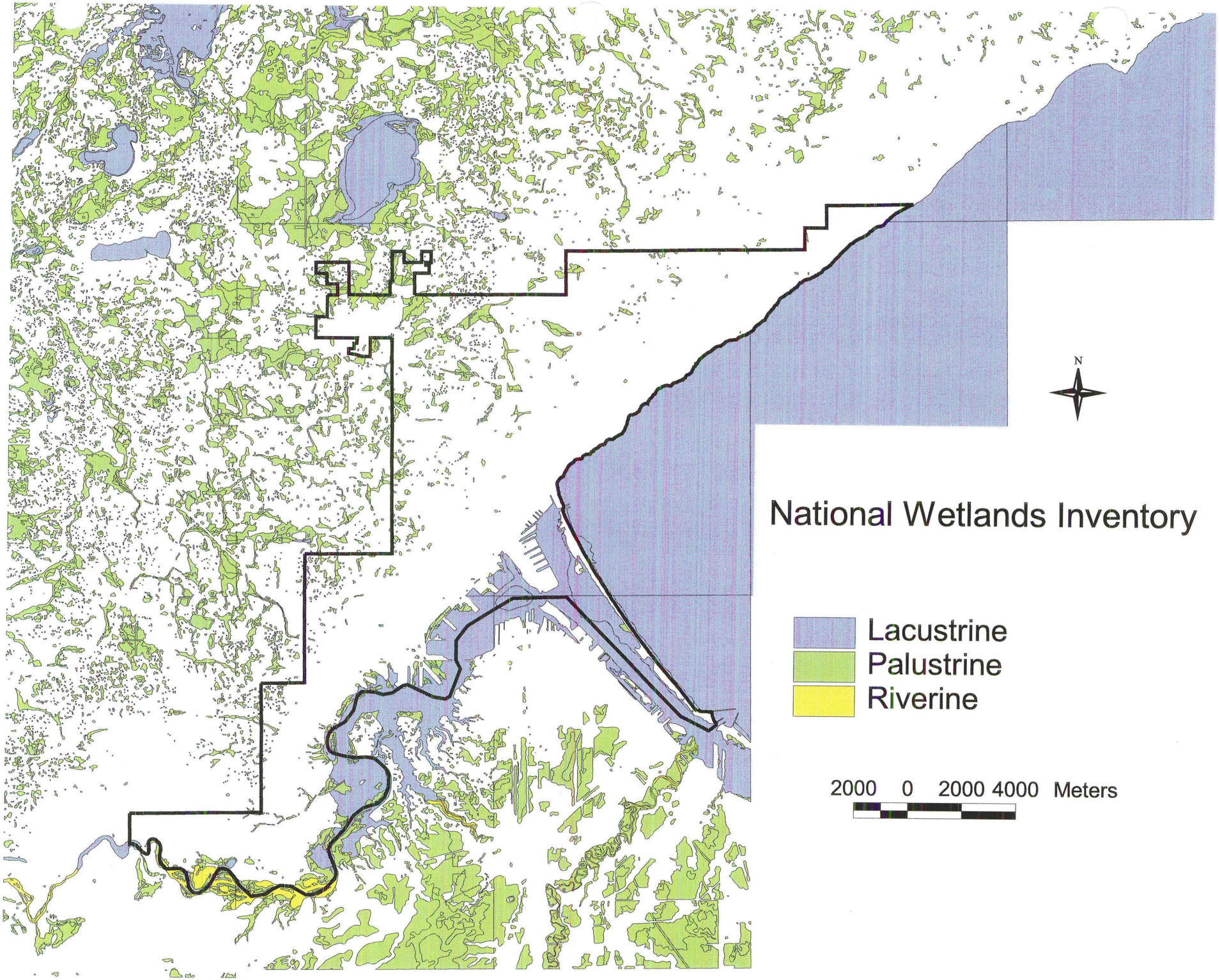
			11	Norway pine
			12	jak pine
			13	scotch pine
			14	ponderosa pine
			15	white spruce
			16	balsam fir
			17	lowland black spruce
			18	upland black spruce
			19	tamarack
			20	cedar
			21	red cedar
			22	mixed swamp conifers
			23	cut over
			24	upland grass
			25	lowland grass
			26	marsh
			27	bog-muskeg
			28	upland brush
			29	lowland brush
			30	water
			31	gravel pit
			32	agriculture
			33	industrial
			34	recreation
			35	transportation
			36	other
cover_size	38	2,2,I		Average size in diameter of breast height (d.b.h.) of the cover type.
			1	0-4.9" d.b.h.
			2	5-8.9" d.b.h.
			3	9"+ d.b.h.
stocking	40	2,2,I		An indication of growing-space occupancy relative to a standard usually based on basal area or stand density.
			1	poor
			2	medium
			3	well
				Age of the stand at

age	42	3,3,I	0-999	the time of the data conversion to the common inventory format. Refer to time period of content in metadata.
measure_year	45	4,4,I		The year the stand level data was collected.
site_index	49	3,3,I		A measure of actual or potential forest productivity, expressed in terms of the average height of trees included in a specific stand component (site index species).
site_index_species	52	3,3,I		

1	black ash
2	green ash
3	white ash
4	elm
5	silver maple
6	red maple
7	sugar maple
8	willow
9	trembling aspen
10	bigtooth aspen
11	paper birch
12	yellow birch
13	balm-of-Gilead (balsam poplar hybrid)
14	cottonwood
15	hybrid poplar
16	basswood
17	walnut
18	butternut
19	cherry
20	buckeye
21	northern red oak
22	black oak
23	northern pin oak
24	white oak
25	bur oak

			26	scarlet oak
			27	bitternut hickory
			28	shagbark hickory
			29	pignut hickory
			30	hackberry
			31	box elder
			32	iron wood
			33	river birch
			34	blue beech
			35	locust
			36	white pine
			37	Norway pine
			38	jack pine
			39	Scotch pine
			40	ponderosa pine
			41	Austrian pine
			42	balsam fir
			43	white spruce
			44	Colorado blue spruce
			45	Norway spruce
			46	black hills spruce
			47	black spruce
			48	tamarack
			49	white cedar
			50	red cedar
			51	hemlock
			52	douglas fir
			53	European larch
			54	Japanese larch
			55	Siberian larch
administrator	55	2,2,I		Manager of the stand.
			1	State
			2	County
			3	United States Forest Service
			4	Bureau of Indian Affairs
			5	Private
			6	Private Industrial
			7	National Park Service
			8	Municipal

reconnaissance level	57	2,2,I		The method used to inventory the stand.
			0	Unknown
			1	Visited on the ground.
			2	Air photo interpreted (AI) or other sources.
stand-id	59	30,30,C		Each agencies unique stand-id.
			State	owner# - section# - type# - township# - range# - direction #
			USFS	district# - compartment# - stand#
			County	township# - range# - polygon id


N
National Wetlands Inventory
Lacustrine
Palustrine
Riverine
2000 0 2000 4000 Meters

National Wetlands Inventory Polygons

Table Name	Field Name	Begin Column	Definition	Valid Values	Description
nwixxpy3.pat					ARC/INFO Polygon Attribute Table (PAT)
	NWI_CODE	25	4, 4, I		A unique numeric code assigned to the full Cowardin Classification Description
	NEW_COW	29	16, 16, C		A text string containing the full Cowardin description as a composite. It is a composite code of values contained within the detailed descriptive codes listed below. The basic form is: / . If any of these values are absent, the string is compressed so that no blanks are present. The "/" character is only used when the CLASS2 and SUBCL2 items are populated.
	SYSTEM	45	1, 1, C		Highest level of the hierarchical classification scheme. Caution should be used in interpreting codes within this item. Wetlands are assigned codes based not only on landscape position, but also vegetation type. The data user should refer to the USFWS publication referenced in the "Basic Information" section of this description (above) to obtain a complete understanding of the classification scheme.
				R	"Riverine." Predominantly, wetlands and deepwater habitats contained within channels. Riverine Systems are contained in natural or artificial channels periodically or continuously containing flowing water. Upland islands or Palustrine wetlands may occur in the channel, but they are not part of the Riverine System.
					"Lacustrine." Predominantly, wetlands and deepwater habitats situated in lakes exceeding 8 ha (20 acres) in area. Lacustrine System include wetlands and deepwater habitats with all of the following three characteristics: 1) Situated in a topographic depression or a dammed river channel; 2)Lacking trees, shrubs, persistent emergents,

		L	emergent mosses or lichens with greater than 30 percent areal coverage; 3)Total area exceeds 8 hectares (20 acres). Basins or catchments less than 8 hectares in size are included if they have at least one of the following characteristics: A wave-formed or bedrock feature forms all or part of the shoreline boundary; or the catchment has at low water a depth greater than 2 meters (6 feet) in the deepest part of the basin.
		P	"Palustrine." Predominantly, wetlands in lakes less than the Lacustrine area criteria, as well as those dominated shrubs, trees, and persistent emergents. Palustrine Systems include all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. Wetlands lacking such vegetation are also included if they exhibit all of the following four characteristics: 1)Are less than 8 hectares (20 acres); 2)Do not have an active wave-formed or bedrock shoreline feature; 3)Have at low water a depth less than 2 meters (6 feet) in the deepest part of the basin; 4)Have a salinity due to ocean-derived salts of less than 0.5 ppt. All water bodies that are less than 8 hectares (20 acres) in size are considered to be in the Palustrine System unless depth information is available, or unless an active wave-formed or bedrock shoreline is visible.
	SUBSYSTEM 46	2, 2, C	The wetland Subsystem code
		1	"Tidal" in Riverine systems
"Limnetic" in Lacustrine systems			
		2	"Lower Perennial" in Riverine systems
"Littoral" in Lacustrine systems			
		3	"Upper Perennial." (Riverine only)

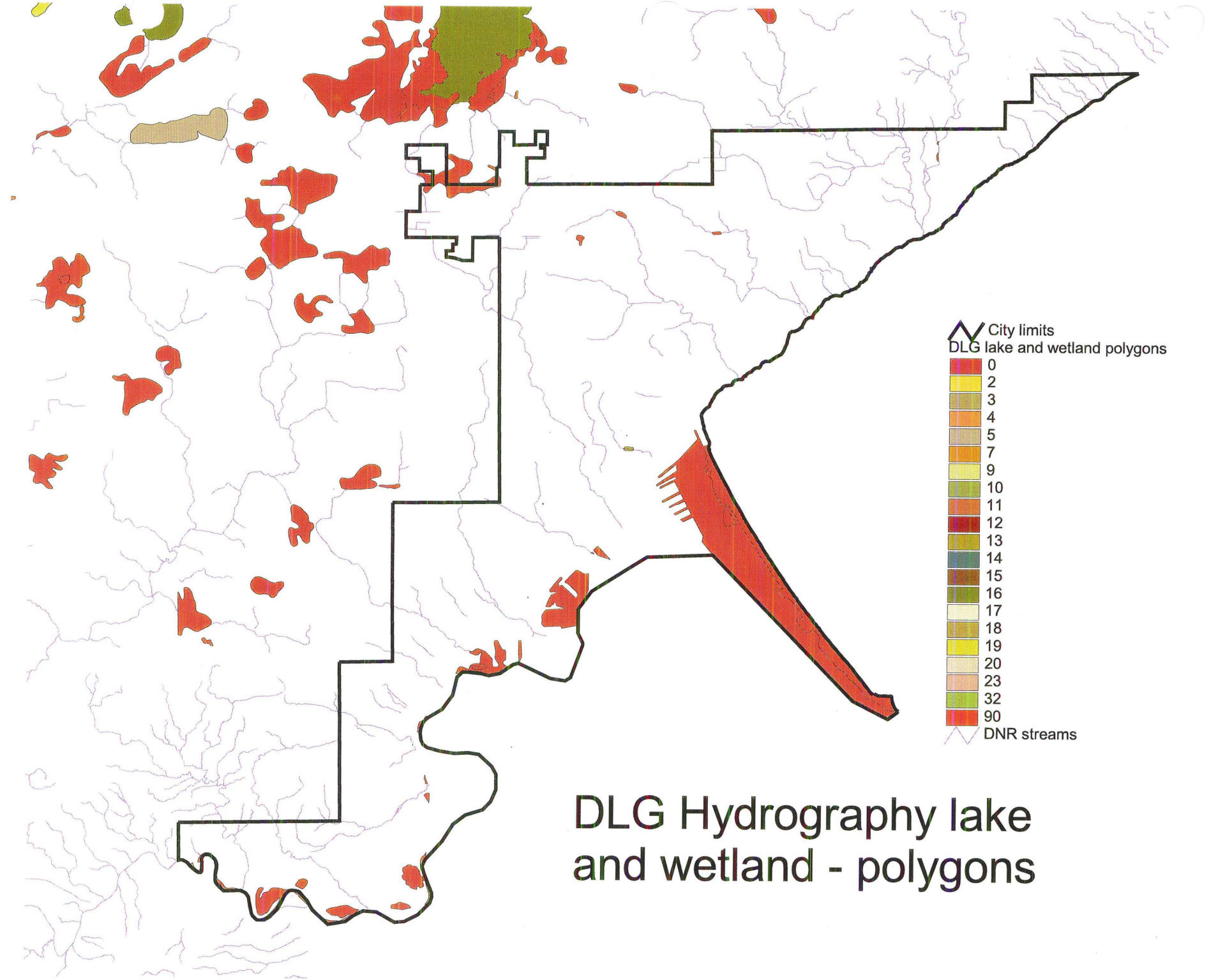
			4	"Intermittent." (Riverine only)
			6	"Unknown Perennial" (Riverine only)
CLASS1	48	2, 2, C		Dominant class within the specified subsystem. The Class code describes the general appearance of the habitat in terms of either the dominant life form of the vegetation or the physiography and composition of the substrate. Life forms (e.g. trees, shrubs, emergents) are used to define classes because they are easily recognizable, do not change distribution rapidly, and have traditionally been used to classify wetlands. Mixed classes (CLASS2_C) are used as sparingly as possible, under two main conditions: (1) The wetland contains two or more distinct cover types each encompassing at least 30 percent areal coverage of the highest life form, but is too small in size to allow separate delineation of each cover type; and (2) The wetland contains 2 or more classes or subclasses each comprising at least 30 percent areal coverage so evenly interspersed that separate delineation is not possible at the scale of photography used for NWI classification. Mixed subclasses are also allowed and follow the same rules for mixed classes. Code descriptions include system and subsystem designations within which that class is found (e.g. the class "Rocky Shore" is found within both Riverine (R), and Lacustrine(L) systems (where it is found only in Subsystem "2" or Littoral), therefore, a value of "R, L2" follows the code description).
			RS	Rock (R)
			UB	Unconsolidated Bottom (R, L, P)
			SB	Streambed (R)
			AB	Aquatic bed (R, L, P)
			RS	Rocky Shore (R, L2)
			US	Unconsolidated Shore (R, L2 P)
			EM	Emergent (R1, R2, L2, P)
			OW	Open Water/Unknown Bottom (L1)
			RB	Rock Bottom (L, P)
			ML	Moss Lichen (P)

			SS	Scrub Shrub (P)
			FO	Forested (P)
SUBCLASS1	50	3, 3, C		Subclasses within each class. Data contained within this item are not uniquely defined in that a single value can have more than one meaning depending on which system it is associated with (e.g. the subclass designator "1" can mean Bedrock, Cobble Gravel, or other values depending on which class it is associated with). Code descriptions include system, subsystem, and class designations within which that class is found (e.g. subclass = 1, Bedrock (R-RS, R-SB, R-RS, L-1-RB, L-2-RB, L-2-RS, P-RB defines the range of systems, subsystems, and classes which use the subclass value of "1" to denote "Bedrock").
CLASS2	53	2, 2, C		Sub-dominant Class. This item contains the same codes as the CLASS1 item.
SUBCLASS2	55	3, 3, C		Subclass to the subdominant class. This item contains the same codes as the SUBCL1 item.
WREG	58	1, 1, C		Water regime modifier. Indicates saturation/flooding status. Precise description of hydrologic characteristics requires detailed knowledge of the duration and timing of surface inundation, both yearly and long-term, as well as an understanding of groundwater fluctuations. Because such information is seldom available, the water regimes that, in part, determine characteristic wetland and deepwater plant and animal communities are described here in only general terms.
			A	Temporarily flooded
			B	Saturated
			C	Seasonally flooded
			D	Seasonally flooded/well drained
			E	Seasonable flooded/saturated
			F	Semi-permanently flooded
			G	Intermittently exposed
			H	Permanently flooded
			J	Intermittently flooded

			K	Artificially flooded
			W	Intermittently flooded/temporary
			Y	Saturated/semi-permanent/seasonal
			Z	Intermittently Exposed/permanent
			U	Unknown
SOILM	59	1, 1, C		The wetland Soil Modifier code
			g	Sometimes used to indicate peatlands, fens or bogs.
			n	Sometimes used to indicate the presence of mineral soils as it pertains to soil taxonomy.
SPEC_MOD1	60	1, 1, C		Special Modifiers to the above classification
			b	Beaver
			d	Partially drained/ditched
			f	Framed
			h	Diked/impounded
			r	Artificially substrate
			s	Spoil
			x	Excavated
SPEC_MOD2	61	1, 1, C		Special Modifiers to the above classification
CIRC39	62	2, 2, I		The Circular 39 Classification outlines a means of classifying the wetland basins of the U.S. It is composed of 20 types of which 8 are found in Minnesota. Four additional types have been defined to completely classify the Minnesota NWI wetlands into Circular 39 types.
			1	Seasonally flooded basin or flat. Soil is covered with water or is waterlogged during variable seasonal periods but usually is well-drained during much of the growing season. Vegetation varies greatly according to season and duration of flooding: from bottomland hardwoods to herbaceous plants. Note that the term seasonally flooded does not have the same meaning in Circular 39 and NWI.
				Wet meadow. Soil is usually without standing water during most of the growing season but is waterlogged within at least a few inches of the surface. Meadows may fill shallow

2	basins, sloughs, or farmland sags, or these meadows may border shallow marshes on the landward side. Vegetation includes grasses, sedges, rushes and various broad-leaved plants. Other wetland plant community types include low prairies, sedge meadows and calcareous fens.
3	Shallow marsh. Soil is usually waterlogged early during the growing season and may often be covered with as much as 6 inches or more of water. These marshes may nearly fill shallow lake basins or sloughs, or may border deep marshes on the landward side. These are common as seep areas on irrigated lands. Vegetation includes grass, bulrush, spikerush and various other marsh plants such as cattail, arrowhead, pickerelweed and smartweed.
4	Deep marsh. Soil is usually covered with 6" to 3' or more of water during the growing season. These deep marshes may completely fill shallow lake basins, potholes, limestone sinks and sloughs, or they may border open water in such depressions. Vegetation includes cattail, reed, bulrush, spikerush and wild rice. In open areas, pondweed, naiad, coontail, water-milfoil, waterweed, duckweed, waterlily or spatterdock may occur.
5	Shallow open water. Shallow ponds and reservoirs are included in this type. Water is usually less than 10' deep and fringed by a border of emergent vegetation similar to open areas of Type 4.
6	Shrub swamp. Soil is usually waterlogged during the growing season and is often covered with as much as 6" of water. These occur mostly along sluggish streams and occasionally on flood plains. Vegetation includes alder, willow, buttonbush, dogwood and swamp-privet.
	Wooded swamps. Soil is waterlogged at least to within a few inches of the

			7	surface during the growing season and is often covered with as much as 1' of water. These occur mostly along sluggish streams, on old riverine oxbows, on flat uplands and in ancient lake basins. Forest vegetation includes tamarack, arborvitae, black spruce, balsam fir, red maple and black ash. Deciduous swamps frequently support beds of duckweed and smartweed. Other wetland plant community types include lowland hardwood swamps and coniferous swamps.
			8	Bogs. Soil is usually waterlogged. These occur mostly in ancient lake basins, on flat uplands and along sluggish streams. Vegetation is woody or herbaceous or both, usually on a spongy covering of mosses. Typical plants are heath shrub, sphagnum moss and sedge. In the North, leatherleaf, Labrador tea, cranberry and cottongrass are often present. Scattered, often stunted, black spruce and tamarack may occur.
			80	Municipal and industrial activities, water regime (WREG_C) is K
			90	Riverine systems, system (SYS_C) is R
			98	Uplands, system (SYS_C) is U
			99	
OLD_COW	64	16, 16, C		The full Cowardin classification as it appears on the original Fish and Wildlife data source (prior to DNR attribute code normalization efforts).



DLG Hydrography lake and wetland - polygons

- Lite Metadata - - Get Data - - View Attribute Table - - View Sample -

U.S. Geological Survey

DLG Hydrography lake and wetland - polygons

This page last update: 04/19/2000 3:26:48 PM
metadata created using Minnesota Geographic Metadata Guidelines .

Go to Section:
1. Identification Information
2. Data Quality Information
3. Spatial Data Organization Information
4. Spatial Reference Information
5. Entity and Attribute Information
6. Distribution Information
7. Metadata Reference Information

Section 1 *Identification Information* - - - - - *top*

Originator	U.S. Geological Survey
Title	DLG Hydrography lake and wetland - polygons
System Name	dlglkpy2
Abstract	1:100,000 scale hydrography derived from USGS DLG's of the same scale. The data have been converted into ARC/INFO and the attribute tables restructured and enhanced to better support DNR business practices. This data contains only the polygon portion of the DLG database.
Purpose	Regional hydrographic analysis, medium scale basemapping, limnological studies
Time Period of Content Date	Unknown
Currentness Reference	DLG Data are automated from the most recent USGS sources available. Original DLG to ARC/INFO processing was performed in 1989. No specific study has been undertaken to determine the range of dates associated with this particular data set. Some representations may extend back twenty years or more.
Progress	In Progress
Maintenance and Update Frequency	As Needed
Spatial Extent of Data	Statewide
Bounding Coordinates	E = -89 W = -97.5 N = 49.5 S = 43

Place Keywords	Minnesota
Theme Keywords	Hydrography, Lakes, Streams, Wetlands, DOW numbers
Theme Keyword Thesaurus	None
Access Constraints	None
Use Constraints	Internal DNR use is unrestricted. External use is constrained by the standard, general DNR GIS Data License Agreement
Contact Person Information	Tim Loesch, GIS Application Coordinator DNR-MIS 500 Lafayette Road St. Paul, MN 55155-4011 Phone: (651) 296-0654 FAX: (651) 297-4946 E-mail: tim.loesch@dnr.state.mn.us
Browse Graphic File Name	dlglkpy2_sam.gif
Browse Graphic File Description	
Associated Data Sets	The layer has a coordinate coincident relationship with the dlgstln2 (DLG Streams layer). The user can also expect this data to exhibit generally good positional agreement with other data sets developed by the USGS, especially 1:100,000 scale roads; which are distributed in conjunction with the hydrography data by the USGS.

Section 2 *Data Quality Information* - - - - - *top*

Attribute Accuracy	DLG source data has a 98.5 percent correct accuracy specification. No subsequent tests have been performed following ARC/INFO processing. Water body coding has demonstrated inconsistencies in the reservoir feature type with some man-made waterbodies being classified as lakes.
Logical Consistency	Data are topolocially correct using ARC/INFO 7.0.3. All polygons are closed and lines intersect where intended.
Completeness	Data exist statewide. Lake data are consistently complete at a minimum feature size of approximately 5 acres with mapping to the 2 acre level present in some areas.
Horizontal Positional Accuracy	51 meters
Vertical Positional Accuracy	Not applicable
Lineage	Converted from 1:100,000 scale U.S. Geological Survey (USGS) Digital Line Graphs (DLGs). Most DLG data is automated from the USGS 1:100,000 scale quadrangle series, although in some cases, sets of USGS 7 1/2 minute (1:24,000 scale) Quadrangle maps are photo reduced to scale of 1:100,000 and physically merged into a single source manuscript. Each of these maps covers an area of 1 degree longitude by 1/2 degree latitude. USGS digital production relies on an

automated scanning/vectorization process. DLG data is some of the highest quality federally developed digital geographic data, although it sometimes exhibits coordinate and attribute edgematch problems. The DNR version was originally processed at LMIC, who performed a significant amount of graphic edits to ensure good edgematching. This data was extracted from the LMIC Stream Information System (SIS). It was imported directly from the SIS ARC/INFO library using the ARC/INFO COPY command. The data were then joined into a statewide coverage and the various quadrangle sheet, watershed, and county boundary features which had been overlayed with the hydrography data were removed. The resulting data set of whole stream and lake features were subjected to a non-rigorous visual quality control process for anomolous attribute code behaviour (e.g. large lakes coded as streams). Division of Waters (DOW) lake identifiers were transferred from the original source data, although only those numbers falling within a valid range were included with the data set. Numerous attribute fields were dropped from the polygon attribute table (.PAT) most of which were not applicable for the new version of the data. The layer built using the process described above completely replaced a previous DLG hydrogrpahy layer that lacked polygon topology. The data were subject to another round of processing in 1996 when the original integrated lake and stream components were broken out into separate data layers. This was done to reduce the overall complexity of the data by eliminating non-water polygons created by complex stream drainage patterns (especially in gridded ditched areas). The pure area feature layer exhibit considerable improvements in draw times. The data also underwent some additional validation efforts for Division of Waters (DOW) Lake Numbers, whereas those lakes managed specifically for fisheries were validated by Section of Fisheries staff. Those lakes that have been validated have been assigned a value of 1 in their DOW_VERIFY field.

Source Scale Denominator	100000

Section 3	*Spatial Data Organization Information* - - - - - *top*
Native Data Set Environment	Arc/Info 7.x
Geographic Reference for Tabular Data	not Applicable
Spatial Object Type	Vector
Vendor Specific Object Types	Poly
Tiling Scheme	County

Section 4	*Spatial Reference Information* - - - - - *top*
Horizontal Coordinate Scheme	UTM
Ellipsoid	GRS1980

Horizontal Datum	NAD83
Horizontal Units	meters
Distance Resolution	meters
Altitude Datum	n/a
Altitude Units	n/a
Depth Datum	n/a
Depth Units	n/a
Cell Width	0
Cell Height	0
Latitude Resolution	0
Longitude Resolution	0
UTM Zone Number	15
SPCS Zone Identifier	0
County Coordinate Zone Identifier	0
Coordinate Offsets or Adjustments	n/a
Map Projection Name	n/a
Map Projection Parameters	n/a
Other Coordinate System's Definition	n/a

Section 5 *Entity and Attribute Information* - - - - - *top*

Entity and Attribute Overview

Area features attributized as lakes, wetlands, inundated areas, tailings ponds, sewage ponds, fish hatcheries, and other minor water body types. Most of these additional minor water body types are inconsistently mapped and therefore do not constituent reliable attribute information.

Entity and Attribute Detailed Citation

HTML Table

Section 6 *Distribution Information* - - - - - *top*

Publisher	Minnesota DNR - MIS Bureau
Publication Date	10/1/1997
Contact Person Information	Robert Maki, GIS Database Coordinator Minnesota DNR 500 Lafayette Road, Box 11

	St. Paul, MN 55155 Phone: (651) 297-2329 FAX: (651) 297-4946 E-mail: robert.maki@dnr.state.mn.us
Distributor's Data Set Identifier	dlglkpy2
Distribution Liability	None stated
Transfer Format Name	7.1.2
Transfer Format Version Number	ARC/INFO
Transfer Size	64
Ordering Instructions	Contact above Person
Online Linkage	DNR Data Deli

Section 7	*Metadata Reference Information - - - - - - top*
Metadata Date	3/30/1999
Contact Person Information	Robert Maki, GIS Database Coordinator Minnesota DNR - MIS Bureau 500 Lafayette Road Saint Paul, MN 55155 Phone: (651) 297-2329 FAX: (651) 297-4946 E-mail: robert.maki@dnr.state.mn.us
Metadata Standard Name	Minnesota Geographic Metadata Guidelines
Metadata Standard Version	1.1
Metadata Standard Online Linkage	http://www.lmic.state.mn.us/gc/stds/metadata.htm

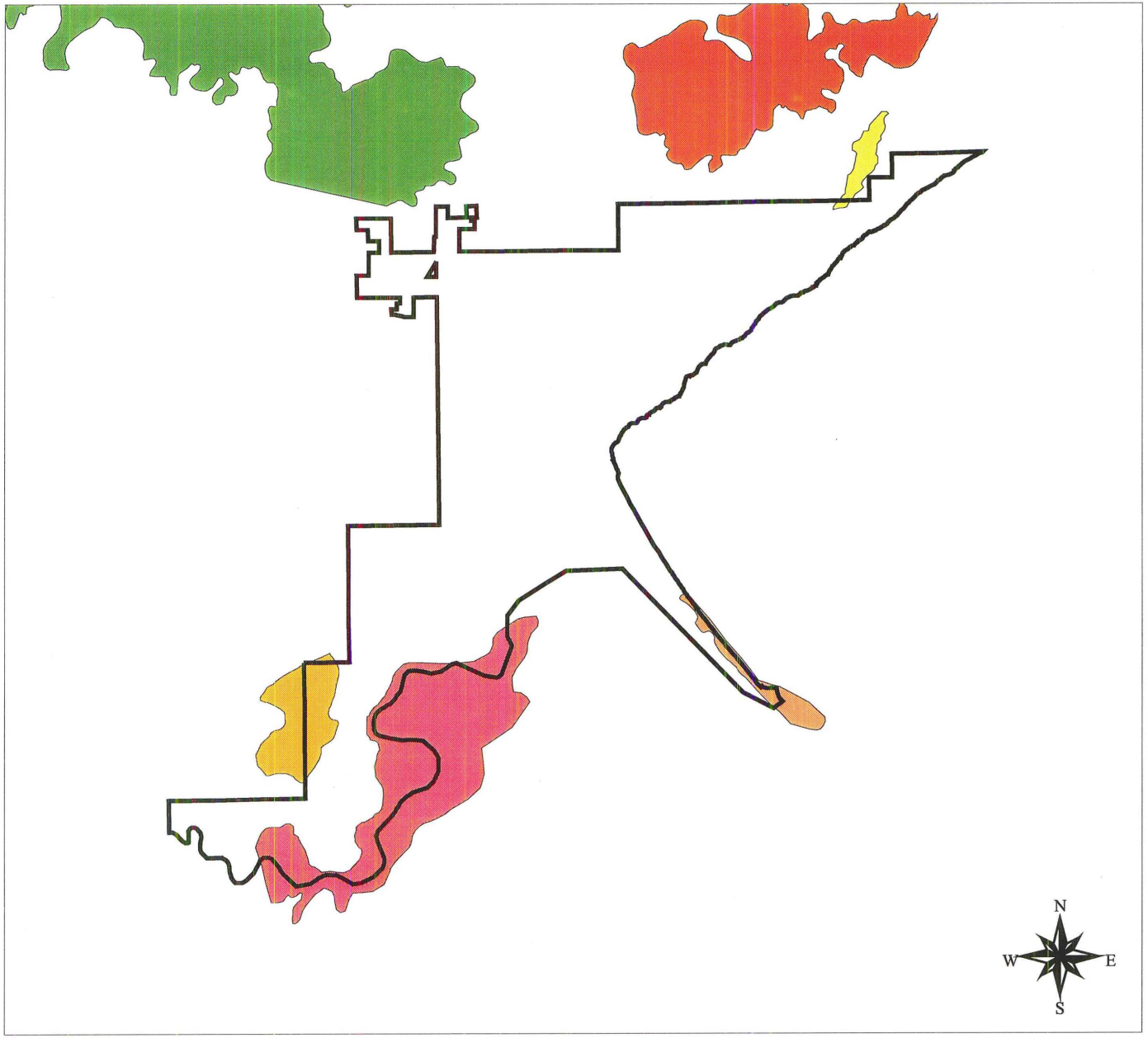
Biological Diversity

Municipal Boundaries

- Duluth

Sites of Biological Diversity

- Artists Point
- Boulder
- Brule
- Cascade
- Cloquet
- Estuary
- Fish
- Hasty Brook
- Highland
- Kettle Lake
- Knife
- Lester-Amity
- Magney-Snively
- Manitou
- Marble
- Mississippi Creek
- Moose Mountain
- Otter
- Perch
- Points
- Sawtooth
- Splitgoose
- Swamp River
- Temperance
- Tettegouche



5 0 5 10 Kilometers

Biological Diversity

North Shore Subsection Survey for sites of biological diversity significance
Minnesota County Biological Survey agreement with The Nature Conservancy
July 1998 through December 1999

The Minnesota County Biological Survey will follow a multi-level procedure to identify preliminary sites of biodiversity significance in, near and around Lake Superior Highlands (the "project area"). The first phase of this project involves conducting rapid assessments. MCBS will obtain and evaluate aerial photography, bearing tree data, soils data, National Wetlands Inventory data, land use data, and relevant other existing natural resources data including timber stand data, and relevant other existing natural resources data including timber stand data, wildlife habitat inventories, parks surveys, research natural areas assessments, museum and herbarium records for the project area. MCBS will also review and provide limited verification of classification of satellite imagery resulting from the GAP Analysis project and Minnesota's Forest Bird Diversity Initiative. The goal will be to identify at least one representative landscape area in each Land Type Association within the North Shore Subsection of Minnesota's Ecological Classification System (MN DNR 1996) and to target sites within this area for further survey. The prioritization of these sites and selection of additional sites within the subsection will be based on: (1) the potential for large concentrations of globally significant elements. (2) the potential for elements unique to the Great Lakes ecosystem. (3) the potential for high quality examples of the rarest globally significant natural communities. (4) the potential of the site for maintenance of key ecosystem functions. 5) the proximity or inclusion of important aquatic features currently being identified in a parallel project. (6) The potential for outstanding examples of representative natural communities.

Following site selection, MCBS will conduct aircraft and limited ground surveys to assess potential natural areas prior to September 1, 1998. During the 1999 field season, of this contract, vegetation samples will be collected and surveys of selected rare species will be conducted. Species searches will be expanded contingent on proposed extension of the Minnesota County Biological Survey (MCBS) into the region in 1999. All specimens collected by MCBS will be deposited in repositories at the Bell Museum of Natural History at the University of Minnesota, St. Paul (Minnesota). All data will be entered into the Rare Species Database, the Vegetation Sampling Database, Site Database and associated ARC\VIEW and ARC\INFO files of the Natural Heritage Information System, The Natural Heritage and Nongame Research Program, Section of Ecological Services, Department of Natural Resources, St. Paul, MN. At the conclusion of this project, summary of completed inventory data, maps and information will be produced and distributed in hard copy and electronic format to The Nature Conservancy. A preliminary summary of inventory data and maps will be provided to the Great Lakes Program of The Nature Conservancy by September 15, 1998, in a mutually agreed upon format suitable for inclusion in the Lake Superior Highlands portfolio design session.

Minnesota County Biological Survey

Carmen Converse, Minnesota County Biological Survey Supervisor
(651) 296-9782 Box 25, 500 Lafayette Road, St. Paul, MN 55155
carmen.converse@dnr.state.mn.us

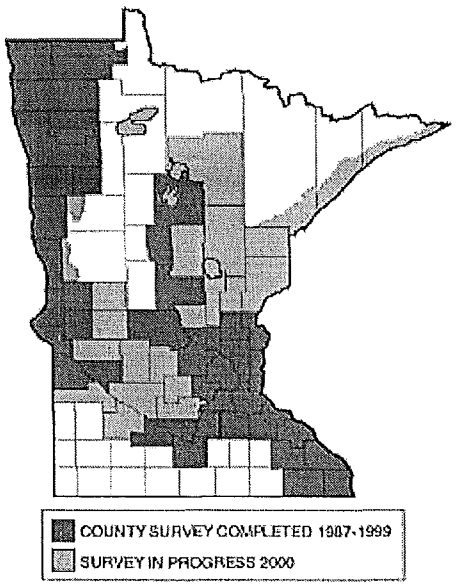
Project Purpose: The Minnesota County Biological Survey began in 1987 as a systematic survey of rare biological features. The goal of the Survey is to identify significant natural areas and to collect and interpret data on the distribution and ecology of rare plants, rare animals, and native plant communities.

Procedure: The Survey uses a multi-level procedure, beginning with evaluation of existing inventory data and followed by an assessment of the quality and condition of selected areas using air photos, classified satellite imagery and ground survey. This is supplemented by specialized field surveys of selected rare species or groups of species. Data are entered into the Department of Natural Resources' Natural Heritage Information System (NHIS), which includes the mapping capabilities of an ARC/INFO Geographic Information System.

FISH & WILDLIFE TODAY
Related Articles:
DNR secures rare northeastern tract F-'96
New Clay County map reveals few remaining prairies or rare species S-'97

Status: Survey results have contributed significantly to the knowledge of the status and distribution of the state's flora, fauna, and native plant communities. To date the Survey has been completed in 41counties and is underway in all or portions of 23 counties. Ecological Units define targeted areas in parts of western and northeastern Minnesota (Red River Prairie and North Shore subsections) Since 1987, over 10300 new records of rare features have been recorded in the Rare Features Database of the NHIS and data from over 5000 vegetation plots have been added to the vegetation database. Ten species of native plants and two species of amphibians not previously documented in Minnesota were recorded by MCBS.

One outcome of MCBS is the publication of the book, Minnesota's St. Croix River Valley and Anoka Sandplain: a guide to native habitats, and set of companion wall maps. Published maps that display the results of the Survey are now available for 23 counties.



Natural areas evaluated by MCBS as having high biodiversity significance have received various types of protection. In Stearns County, MCBS data are being used in the county comprehensive planning process. The county and the DNR's Scientific and Natural Area Program have worked together to design a park and natural area plan for Quarry Park that protects rare resources such as rock outcrop native plant communities, red-shouldered hawks, Acadian flycatchers, and orchids while also providing recreational opportunities. In southeastern Minnesota, a project area proposed as the Mound Prairie Wildlife Management Area was based in part, on evaluations in

Houston County by MCBS. This area contains habitat for the rare Blanding's turtle and other wildlife, including game species. In the Twin Cities metropolitan area, a cooperative public/private Greenways and Natural Areas program is using data from MCBS to assist with prioritization of sites for acquisition and other forms of protection.

Cooperators: The Bell Museum of Natural History is the repository of specimens collected by MCBS. Examples of other cooperators have included Olmsted, Stearns, and Aitkin counties, the Chippewa and Superior National Forests, the Minnesota Army National Guard (Camp Ripley rare feature surveys), and the US Fish and Wildlife Service (recommendations for prairie sites to include in the Northern Tallgrass Prairie Habitat project).

Project Contact: Carmen Converse, Minnesota County Biological Survey Supervisor, Box 25, 500 Lafayette Road, St. Paul, MN 55155 (651) 296-9782 E-Mail: carmen.converse@dnr.state.mn.us

Natural Community Rare Species County Maps

Please do not staple
request documents

For Agency Use Only:
Received _____ Due _____ RUSH
Related ES# _____
Search Radius _____mi. ER/All EOs _____
Quads _____
Map'd ____ C / NoC Let ____ Inv ____ Log out _____

MINNESOTA NATURAL HERITAGE INFORMATION SYSTEM DATA REQUEST FORM

Requests generally take 2 to 3 weeks from date of receipt to process, and are processed in the order received.

DATE OF REQUEST _____

WHO IS REQUESTING THE INFORMATION?

Name and Title _____

Agency/Company _____

Address _____
(Street) (City) (State) (ZIP Code)

Phone _____ FAX _____ e-mail _____

WHAT INFORMATION DO YOU NEED?

____ Known occurrences of federally and state listed plants and animals; high quality plant communities; and aggregation sites such as bat hibernacula, colonial waterbird nesting sites, and prairie chicken booming grounds.

Information listed above, plus geological features and state rare species with no legal status.

Other (specify): _____

_____

_____

Frequent applicants: Check here if you DO NOT need a copy of the field-by-field explanation of the printout: ____

WHERE IS THE AREA OF INTEREST? 1) **ENCLOSE A MAP** showing detailed boundaries of the area. 2) Describe the area (PROJECT REVIEW applicants may omit area description but must enclose a map).

_____

_____

FOR PROJECT REVIEWS: If data are being requested for review of a project (developments, road improvements/repair, mining, etc.), provide the following:

County	Twnshp#	Range#	Section(s) (or half-section, quarter-section, etc., if known)
_____	T N	R	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Project Name _____

Project Proposer _____

Project Description _____

_____

Past Land-Use of Project Site

(OVER)

HOW WILL THE INFORMATION BE USED? Describe planned use of information, including in what form and detail you wish to publish this information, if any. _____

_____

_____

_____

_____

FEES

For-profit organizations are charged a fee for this service. In addition, a fee may be charged for large requests from any source. A surcharge (currently $50) is applied for rush orders; if this is a rush order, please check the blank below. Fees subject to change. A fee schedule is available upon request. Please do not include payment with your request; an invoice will be included with our response letter.

____ **Rush**

'The information supplied above is complete and accurate. I understand that material supplied to me from the Minnesota Natural Heritage Information System is copyrighted and that I am not permitted to reproduce or publish any of this copyrighted material without prior written permission from the Minnesota DNR. Further, if permission to publish is given, I understand that I must credit the Minnesota Natural Heritage and Nongame Research Program, Minnesota Department of Natural Resources as the source of the material."

Signature _____

Mail completed forms to:		For further information call:
Endangered Species Environmental Review Coordinator	*(for project reviews)*	(651) 296-8319 or 296-8279
or		
Assistant Database Manager	*(for general requests)*	(651) 296-8324
at		
Natural Heritage and Nongame Research Program		
Department of Natural Resources		
500 Lafayette Road, Box 25		
St. Paul, Minnesota 55155		

Or FAX completed forms to: (651) 296-1811

"A User's Guide to the Natural Heritage Information System," is available from the above sources.

For Agency Use Only:

EO's requiring comment _____

Sources contacted	Topic	Response
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Response Summary _____

_____

_____

_____ Responder _____

MINNESOTA NATURAL HERITAGE PROGRAM ELEMENT OCCURRENCE RECORD

Ename (below): Map Margin #: ___

_____ Occur #: ____

EO Rank: __
EO Acres: _____ EO Est.?: _
County: __ County Name: _____ CBS Site #: ___
LS Region: ___
DNR Code: ____ Quadname: _____
Township: _____ Range: ____ Section: _____ Location/Precision: _
Latitude: __ __ __ Longitude: __ __ __ Threat/Destruct: _

Sources(below):

_____

Collection #: _____ Voucher: _____ Verified: _ # of Releves: __
Last Observation: Month: __ Day: __ Year: ____

Macro Site: _____ Bioreserve Code: ___
Site Name: _____ Siteacres: _____ Est.?: _
Man1: _____
Man2: _____
Man3: _____ MoreMan?: _
Special Stat1-5:___ ___ ___ ___ ___ Current Status: __ Intended Status: __

# of Owners: __ Owncode: __ Owner: _____
Listed Colonial Waterbird Species?: _ Species/Site Monitoring?: _
General Description:

_____
_____
_____
_____
_____
_____

Transcriber: _____ Mapper: _____

MINNESOTA NATURAL HERITAGE PROGRAM RELEVE FORM

DNR, Natural Heritage & Non-game Wildlife Research Program, 500 Lafayette Road, Box 25, St. Paul, MN 55155

Map _____
Enter _____
QC _____
Edit _____
Append _____

DNR RELEVE# _ _ _ _ _ _

---------- SITE DATA ----------

GENERAL INFORMATION

DNR Releve #: _ _ _ _ _ Surveyor's Releve#: _ _ _ _ _ _ _ _ _ _ EO Rec.#: _ _ _ _ _

*Surveyor's ID Code: _ _ _ (_____)

Institution: _____ Purpose of Releve: _____

Date: _ _ Month: _ _ _ Year: _ _ _ _ (e.g. 09 JUL 1998)

MCBS Site#: _ _ _ or Site Name: _____

Ownership: _ _ _ (_____)

*Native Plant Community Type: _ _ (_____)

*Native Plant Community Section: _ _ (_____)

*Native Plant Community Subtype: _ _ (_____)

Community Ranking in Releve: _ _

Stand Typical of Community Type: (Y)es if not, identify appropriate modifier:
(E)cotonal (N)atural disturbance (H)uman disturbance (1) stand < 40 yrs (O)ther _____

Releve Typical of Stand: (Y)es if not, identify appropriate modifier:
(E)cotonal (H)igher Quality (L)ower Quality (C)anopy Gap (O)ther _____

LOCATION INFORMATION

State Code: MN *County Code: _ _ (_____)

*Quad Code: DNR _ _ _ _ (_____)

Township: _ _ _ _ (e.g. 143N) Range: _ _ _ (e.g. 32W) GPS Time: _ _ : _ _ (am) (pm)

QQRT: _ _ QRT: _ _ of Section _ _ Accuracy: (S)caled from quad (F)orty

Latitude: _ _ ° _ _ ' _ _ " (U)ncorrected GPS (Q)uarter Section

Longitude: _ _ ° _ _ ' _ _ " (C)orrected GPS (N) Section

or UTM: _ _ _ _ _ _ _ N _ _ _ _ _ _ _ E (E)stimated (T)ownship

Permanent Marker: (Y)es (N)o _____ (Z) unknown (Y) county

Forest Stand#: _ _ _ _ _ _

RELEVE INFORMATION

Releve Size: _ _ m. x _ _ m. = _ _ _ sq. m. Elev. _ _ _ _ ft.

Slope: _ _ (°) or _ _ (%) Aspect: _ _ (e.g. NW)

Slope Position: (C)rest (U)pper (M)iddle (L)ower (T)oe (D)epression (F)lat

Litter (L) Type: _____ Litter (L) Depth _ _ cm

Humus (H) Type: (Mull) lacking F+H layer; leaves decomposed in one season
(Moder) H: black, silty; partially incorporated into mineral soil
(Mor) H: brown ; fungal mat; not incorporated into mineral soil

Humus (F+H) Depth _ _ cm

A_h Horizon Depth (_) _ _ _ cm (>)

Soil1 Texture: _ _ _ _ (_____) Soil1 Depth (_) _ _ _ cm

Soil2 Texture: _ _ _ _ (_____) Soil2 Depth (_) _ _ _ cm

Cl=clay, Si=silt, Lo=loam, Sa=sand, Ro=rock, Mu=muck, Pe=peat, MP=moss peat, SP=sedge peat

Ave. Depth to Bedrock (_) _ _ _ cm.

Exposed Rock _ _ _ % Ave. Peat Depth (_) _ _ _ cm.

Rock Type: _____ Depth of Standing Water (_) _ _ _ cm.

Drainage Class: (E)xcessively (W)ell (M)oderately (S)omewhat Poorly (P)oorly (V)ery Poorly Drained

Context, Disturbance,

Remarks: _____

_____

_____

_____

*Variables with computerized code dictionaries (See Releve Handbook) (200 char.)

BASAL AREA					DIAMETERS
Species	L/D	1	2	Ave.	DBH (cm)

Notes:

Revised June 1999

1999 North Shore Plans
Minnesota County Biological Survey (MCBS)

In preparing for the survey of the North Shore subsection, MCBS identified twenty-five potential Landscape Study Areas (LSAs) North Shore subsection in the fall of 1998. Nine of these (☼ **in bold**) LSAs within each of three segments of the North Shore were selected as the focus of 1999 field work.

Some of the criteria used in selecting these LSAs are as follows:

- Area is representative of the Land Type Association (LTA) (displays the range of environmental gradients, complexes and connectivity of habitats in the LTA).
- Appears to contain high quality examples of high priority native plant communities.
- Contains concentrations of documented records of rare species or potential rare species habitat.
- Contains some character of the composition, association, natural disturbance patterns and spatial distribution of native habitats of the pre-European landscape.
- Contains elements of distinctive watershed and aquatic features identified in a parallel process.

Four MCBS botanist/plant ecologists are conducting surveys of the native plant communities and rare plants of these LSAs and the Lake Superior shoreline in 1999. Surveys of selected lakes with a focus on rare aquatic plant searches are underway in the St Louis County portion of the subsection.

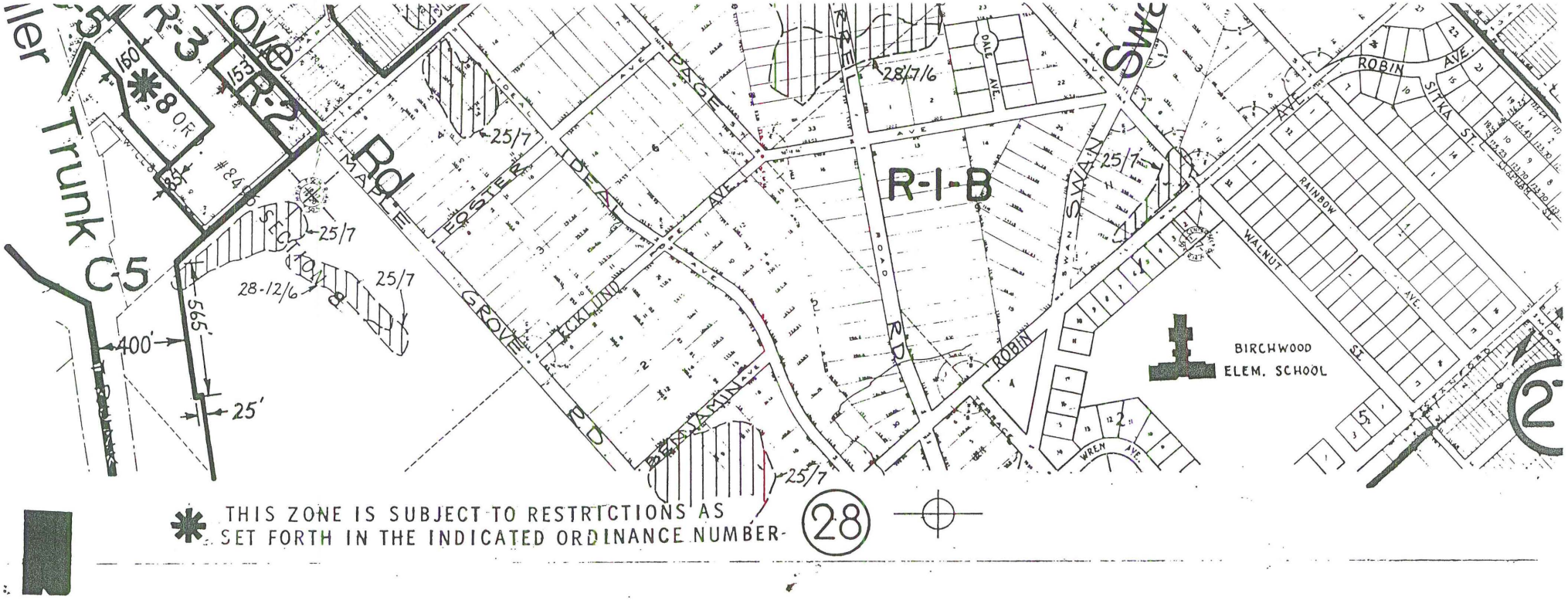
1999 North Shore MCBS staff

Cook County: Chel Anderson (plant ecologist, Hovland) chel.anderson@dnr.state.mn.us (218) 475-0147
Lake County: Mike Lee (plant ecologist, Finland) michael.lee@dnr.state.mn.us (218)353-7619
St. Louis County: Carol Reschke (plant ecologist, Two Harbors) carol.reschke@dnr.state.mn.us (218) 834-6328.
Karen Myhre (Botanist) kmyhre@mlecmn.net (218) 927-3684

LSAs currently displayed on maps are only intended as a means of establishing survey priorities for MCBS and do not represent recommendations for specific management or conservation action.

Northern LSAs (Chel)	*Central LSAs (Mike)*	*Southern LSAs (Carol)*
Swamp River	**Manitou ☼**	Kettle Lake
Brule	Tettegouche	Knife
Grand Marais	**Splitgoose ☼**	Boulder Lake
Mississippi Creek	Marble	Fish Lake
Cascade	Highland	Lester-Amity
Sawtooth ☼	Cloquet River	Moose Mountain
Temperance ☼		**Points ☼**
		Estuary ☼
		Otter
		Perch ☼
		Hasty Brook ☼
		Magney Snively ☼

Please contact Carmen Converse, MCBS supervisor if you have comments about this plan or suggestions for additional areas to survey: carmen.converse@dnr.state.mn.us (651)-296-9782



AP OF KNOWN WETLANDS

Certified By The Secretary Of The City Planning
mmission, Based Upon Technical Data Supplied By
ners.

e Fact A Wetland Is Not Shown On This Map Does
t Mean That Such Wetland Is Not Subject To City Of
luth Ordinances.

Of Duluth Feb.1,1982

Scale
0 200 400 600 800ft

WETLAND DETERMINATION SOURCE

Barr Engineering Study,1979

Source as Noted

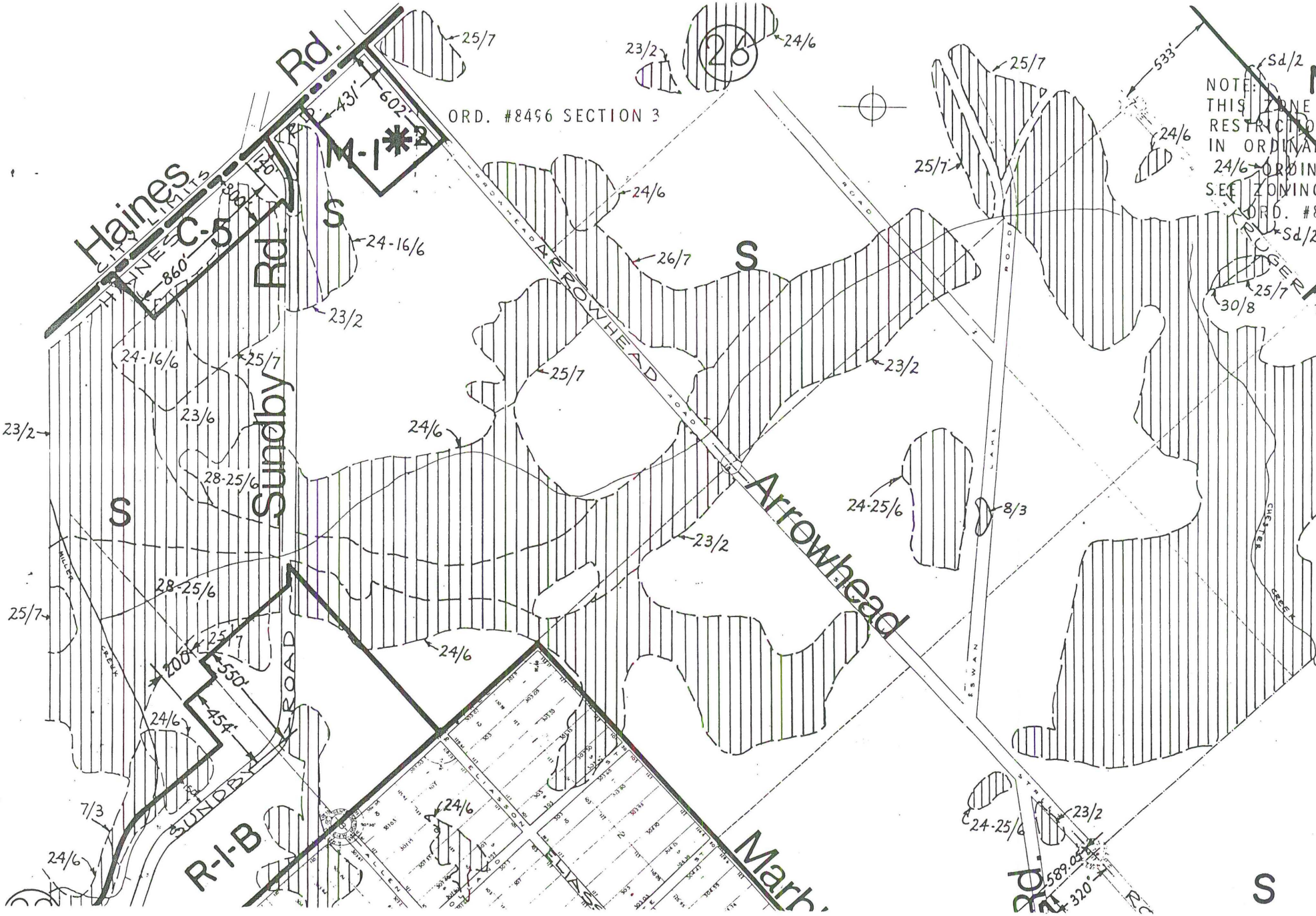
28 | 1

Wetland Type Types 2 Through 7 A
By The City Of Duluth Legislative C
51 (Water Resource Management C
See Description In The Front Of Th

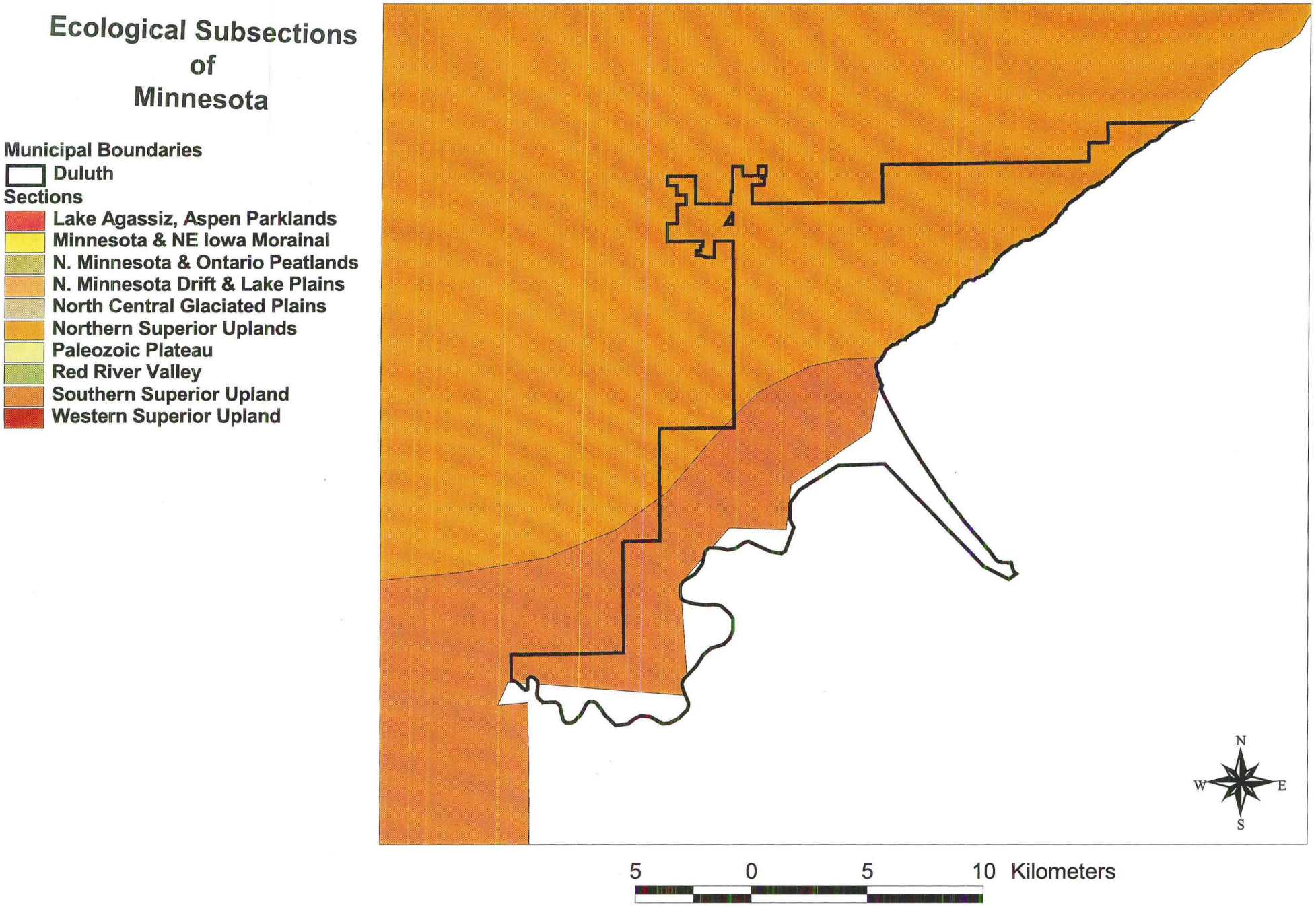
Vegetative Type, If Available, See
In Front Of This Book.

Note: Zoning Shown On This Map May Be Out Of Date:

Note: Flood Plains & Shorelands Are Also Regulated By Chapte
Duluth Cith City Code (See Official Floodplain And Shorel


Haines
CITY LIMITS
C-5
M-1*
ORD. #8496 SECTION 3
Sumpby Rd.
Arrowhead
Arrowhead Road
Marsh
Rd.
R-1-B
SUNDAY
ELIAS
ELIAS
ALLEN
ROAD
ROAD
LANE
CREEK
CREEK
CHESTER
CREEK
NOTE:
THIS ZONE
RESTRICTIO
IN ORDINA
ORDIN
SEE ZONING
ORD. #8
25/7
24/6
23/2
24-16/6
26/7
30/8
24-25/6
8/3
28-25/6
23/6
7/3
533'
860'
602'
431'
300'
200'
550'
454'
589.05'
320'
S

Ecological Subsections of Minnesota



- Lite Metadata - - Get Data - - View Attribute Table - - View Sample -

Minnesota DNR - Division of Forestry

Ecological Subsections of Minnesota

This page last update: 02/10/2000 3:08:25 PM
metadata created using Minnesota Geographic Metadata Guidelines .

Go to Section:
1. Identification Information
2. Data Quality Information
3. Spatial Data Organization Information
4. Spatial Reference Information
5. Entity and Attribute Information
6. Distribution Information
7. Metadata Reference Information

Section 1	*Identification Information - - - - - top*
Originator	Minnesota DNR - Division of Forestry
Title	Ecological Subsections of Minnesota
System Name	ecssbne2
Abstract	This coverage provides information related to Ecosystem delineation in Minnesota. The boundaries of the polygons of this coverage were derived from Land Type Association (LTA) delineations that were compiled from a visual/interpretive process using Topography, Wetlands, Surficial Geology, Soils, Landsat Imagery and Climatic conditions. This coverage replaces the ECSSBPY2 coverage which was delineated using coarser techniques and data.
Purpose	This dataset can be used for a variety of planning activities and education.
Time Period of Content Date	1999
Currentness Reference	The ECS polygons were delineated during part of the process of identifying Land Type Associations in 1997-1998 and are a refinement of the original ECS
Progress	Complete
Maintenance and Update Frequency	None Planned
Spatial Extent of Data	Statewide-Minnesota
Bounding Coordinates	E = -89 W = -97.5 N = 49.5 S = 43
Place Keywords	Minnesota

Theme Keywords	Province, Section, SubSection
Theme Keyword Thesaurus	
Access Constraints	None
Use Constraints	None
Contact Person Information	Tim Loesch, GIS Application Coordinator DNR-MIS 500 Lafayette Road St. Paul, MN 55155-4011 Phone: (651) 296-0654 FAX: (651) 297-4946 E-mail: tim.loesch@dnr.state.mn.us
Browse Graphic File Name	ecssbne2_sam.gif
Browse Graphic File Description	
Associated Data Sets	Land Type Associations, Geomorphology of Minnesota

Section 2	*Data Quality Information - - - - - - top*
Attribute Accuracy	Unknown. Automated tests were conducted on all data to ensure that no invalid codes exist within the data set
Logical Consistency	Data are topolocially correct using ARC/INFO 7.1.2. All polygons are closed and lines intersect where intended. Region feature classes were created for the three levels of ECS classes, Province, Section and Subsection.
Completeness	All ECS boundaries in the state were re-located based on the definition of the Land Type Association boundaries, the fourth step in the ECS classification process. Significant differences exist between the older version of the ECS data.
Horizontal Positional Accuracy	Unknown
Vertical Positional Accuracy	Not Applicable
Lineage	This data set was produced as a derivitive of the Land Type Association (LTA) delineation process. LTA's were delineated by manually interpreting a variety of land surface information including topography, wetland distributions, soil characteristics, Hydrography, presettlement vegetation, bedrock type, Landsat satellite imagery, geomorphology and local knowledge of the landscape from individuals on each landscape team. The interrelationship of features were examined by overlaying thematic maps and observing coincident patterns. This was largely a visual interpretive process. LTA's boundaries were delineated on mylar printouts of the Geomorphology of Minnesota data based on USGS 1:100,000 scale tiles. These mylars were then used as a basis for the capturing the LTA boundaries in digital format. Where possible, LTA boundaries were matched with existing coverage delineations-particularly from the Geomorphology of Minnesota dataset. In other locations, boundaries that could not be captured from other sources were hand digitized from the mylar base-maps. Once the LTA

	coverage was complete, each polygon was assigned a ECS code based on the National Hierarchical Framework of Ecological Units standards. This coverage was then used as a basis for creating the Regions coverage of the three top levels of the ECS classification system found in this cover.
Source Scale Denominator	100000

Section 3	*Spatial Data Organization Information - - - - - - top*
Native Data Set Environment	Arc/Info 7.1.1
Geographic Reference for Tabular Data	
Spatial Object Type	Vector
Vendor Specific Object Types	Poly, Arc
Tiling Scheme	State

Section 4	*Spatial Reference Information - - - - - - top*
Horizontal Coordinate Scheme	UTM
Ellipsoid	GRS1980
Horizontal Datum	NAD83
Horizontal Units	meters
Distance Resolution	meters
Altitude Datum	n/a
Altitude Units	n/a
Depth Datum	n/a
Depth Units	n/a
Cell Width	0
Cell Height	0
Latitude Resolution	0
Longitude Resolution	0
UTM Zone Number	15
SPCS Zone Identifier	0
County Coordinate Zone Identifier	0
Coordinate Offsets or Adjustments	n/a

Map Projection Name	n/a
Map Projection Parameters	n/a
Other Coordinate System's Definition	n/a

Section 5 *Entity and Attribute Information* - - - - - - *top*

Entity and Attribute Overview	
Entity and Attribute Detailed Citation	Ecological Subsections of Minnesota ECSSBNE2.PAT
HTML Table	PROVNAME - 25 - 40,40,C - - The ECS Province Name ECS_PROV - 65 - 3,3,I - - National Hierarchical Framework of Ecological Units identifier SECNAME - 68 - 40,40,C - - The ECS Section name ECS_SEC - 108 - 3,3,I - - National Hierarchical Framework of Ecological Units identifier SUBSECNAME - 112 - 40,40,C - - The ECS Subsection Name ECS_SUBSEC - 152 - 3,3,I - - National Hierarchical Framework of Ecological Units identifier Version - 157 - 4,4,C - - ECS Version (Year and Version)

Section 6 *Distribution Information* - - - - - - *top*

Publisher	Minnesota DNR - MIS Bureau
Publication Date	6/1/1999
Contact Person Information	Robert Maki, GIS Database Coordinator Minnesota DNR 500 Lafayette Road, Box 11 St. Paul, MN 55155 Phone: (651) 297-2329 FAX: (651) 297-4946 E-mail: robert.maki@dnr.state.mn.us
Distributor's Data Set Identifier	ecssbne2
Distribution Liability	None stated
Transfer Format Name	7.1.2
Transfer Format Version Number	ARC/INFO
Transfer Size	0
Ordering Instructions	Contact above Person
Online Linkage	DNR Data Deli

Section 7	*Metadata Reference Information - - - - - - top*
Metadata Date	7/7/1999
Contact Person Information	Tim Loesch, GIS Applications Programmer Minnesota DNR - MIS Bureau 500 Lafayette Road St. Paul, MN 55155 Phone: 651-296-0654 FAX: 651-297-4946 E-mail: tim.loesch@dnr.state.mn.us
Metadata Standard Name	Minnesota Geographic Metadata Guidelines
Metadata Standard Version	1.1
Metadata Standard Online Linkage	http://www.lmic.state.mn.us/gc/stds/metadata.htm

Ecological Subsections of Minnesota

Table Name	Field Name	Begin Column	Definition	Valid Values	Description
ECSSBNE2.PAT					
	PROVNAME	25	40,40,C		The ECS Province Name
				Laurentian Mixed Forest Province	
				Eastern Broadleaf Forest Province	
				Tallgrass Aspen Parklands Province	
				Prairie Parkland Province	
	ECS_PROV	65	3,3,I		National Hierarchical Framework of Ecological Units identifier
				212	
				222	
				223	
				251	
	SECNAME	68	40,40,C		The ECS Section name
				Lake Agassiz, Aspen Parklands	
				Minnesota	NE Iowa Morainal
				N. Minnesota	Ontario Peatlands
				N. Minnesota Drift	Lake Plains
				North Central Glaciated Plains	
				Northern Superior Uplands	
				Paleozoic Plateau	
				Red River Valley	
				Southern Superior Uplands	
				Western Superior Uplands	
	ECS_SEC	108	3,3,I		National Hierarchical Framework of Ecological Units identifier

			223N	
			222M	
			212M	
			212N	
			251B	
			212L	
			222L	
			251A	
			212J	
			212K	
SUBSECNAME	112	40,40,C		The ECS Subsection Name
			Glacial Lake Superior Plain	
			Mille Lacs Uplands	
			Border Lakes	
			North Shore Highlands	
			Nashwauk Uplands	
			Laurentian Highlands	
			Littlefork Vermilion Uplands	
			Agassiz Lowlands	
			Chippewa Plains	
			St. Louis Moraines	
			Pine Moraines and Outwash Plains	
			Tamarack Lowlands	
			The Blufflands	
			Rochester Plateau	
			Hardwood Hills	
			Big Woods	
			Anoka Sand Plain	
			St. Croix Moraine	
			St. Paul-Baldwin Plains and Moraines	
			Oak Savannah	
			Aspen Parklands	
			Red River Prairie	
			Minnesota River Prairie	

			Coteau Moraines	
			Inner Coteau	
ECS_SUBSEC	152	3,3,I		National Hierarchical Framework of Ecological Units identifier
			212Ja	
			212Jd	
			212Kb	
			212La	
			212Lb	
			212Lc	
			212Le	
			212Ma	
			212Mb	
			212Na	
			212Nb	
			212Nc	
			212Nd	
			222Lc	
			222Lf	
			222Ma	
			222Mb	
			222Mc	
			222Md	
			222Me	
			223Na	
			251Aa	
			251Ba	
			251Bb	
			251Bc	
Version	157	4,4,C		ECS Version (Year and Version)
			99a	

DISTRIBUTION AND RELATIONSHIPS OF HABITATS AND BIRDS IN THE ST. LOUIS RIVER ESTUARY — MINNESOTA AND WISCONSIN

PREPARED BY

GERALD J. NIEMI
THOMAS E. DAVIS
PERSHING B. HOFSLUND

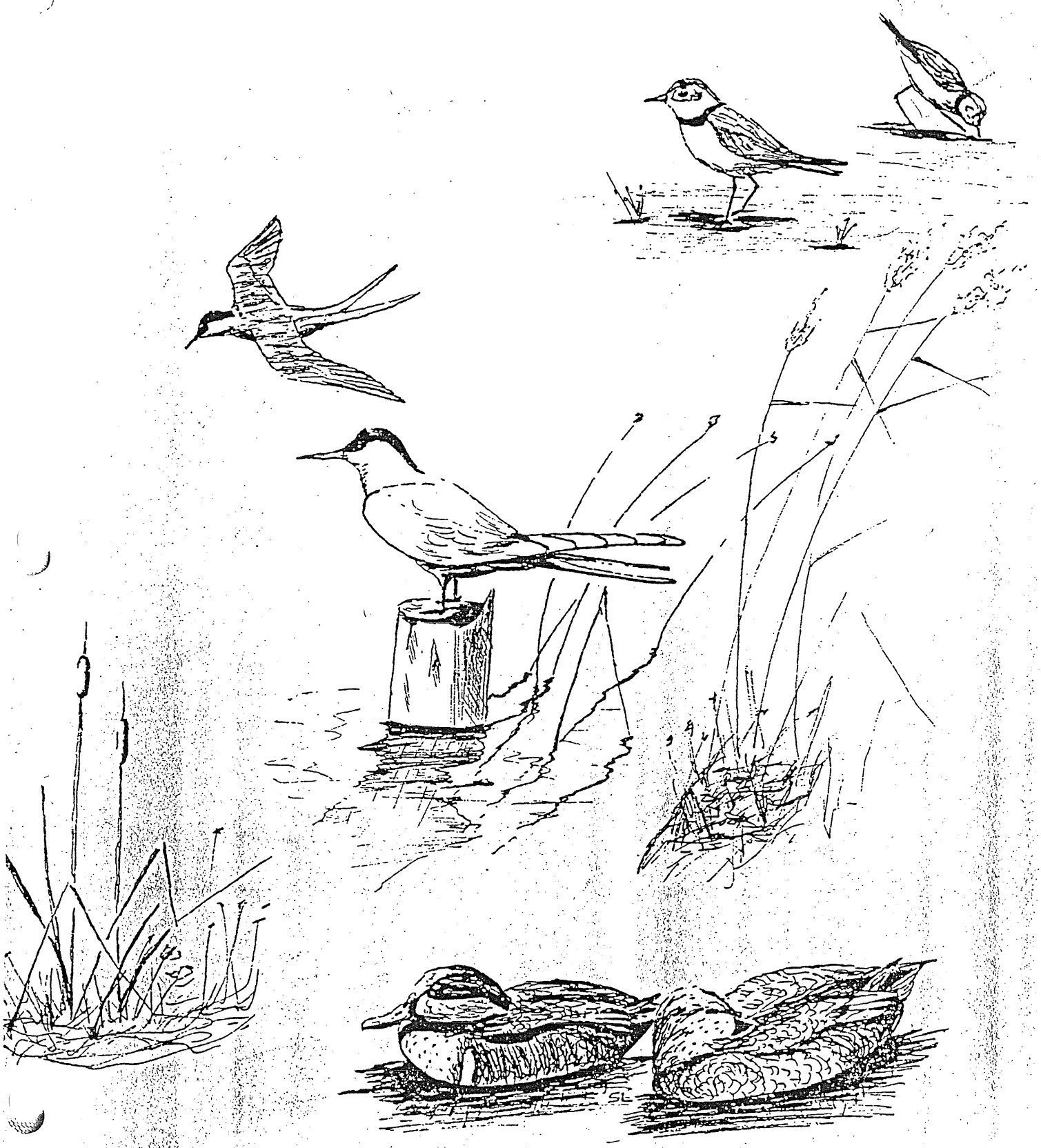
DEPARTMENT OF BIOLOGY
LAKE SUPERIOR BASIN STUDIES CENTER
UNIVERSITY OF MINNESOTA, DULUTH

JULY, 1979

FOR

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
ST. PAUL FIELD OFFICE, ECOLOGICAL SERVICES
538 FEDERAL BUILDING AND U. S. COURTHOUSE
316 NORTH ROBERT STREET
ST. PAUL, MINNESOTA 55101

DISTRIBUTION AND RELATIONSHIPS OF HABITATS AND BIRDS IN THE ST. LOUIS RIVER ESTUARY



DEPARTMENT OF BIOLOGY - LAKE SUPERIOR BASIN STUDIES CENTER
UNIVERSITY OF MINNESOTA, DULUTH, MINNESOTA 55812

ST. LOUIS RIVER ESTUARY

Figure 6. Selected marsh census areas and bird colony locations in the St. Louis River estuary. Colony numbers correspond to Table 5 and marsh letters correspond to Table 7.

ST. LOUIS RIVER ESTUARY

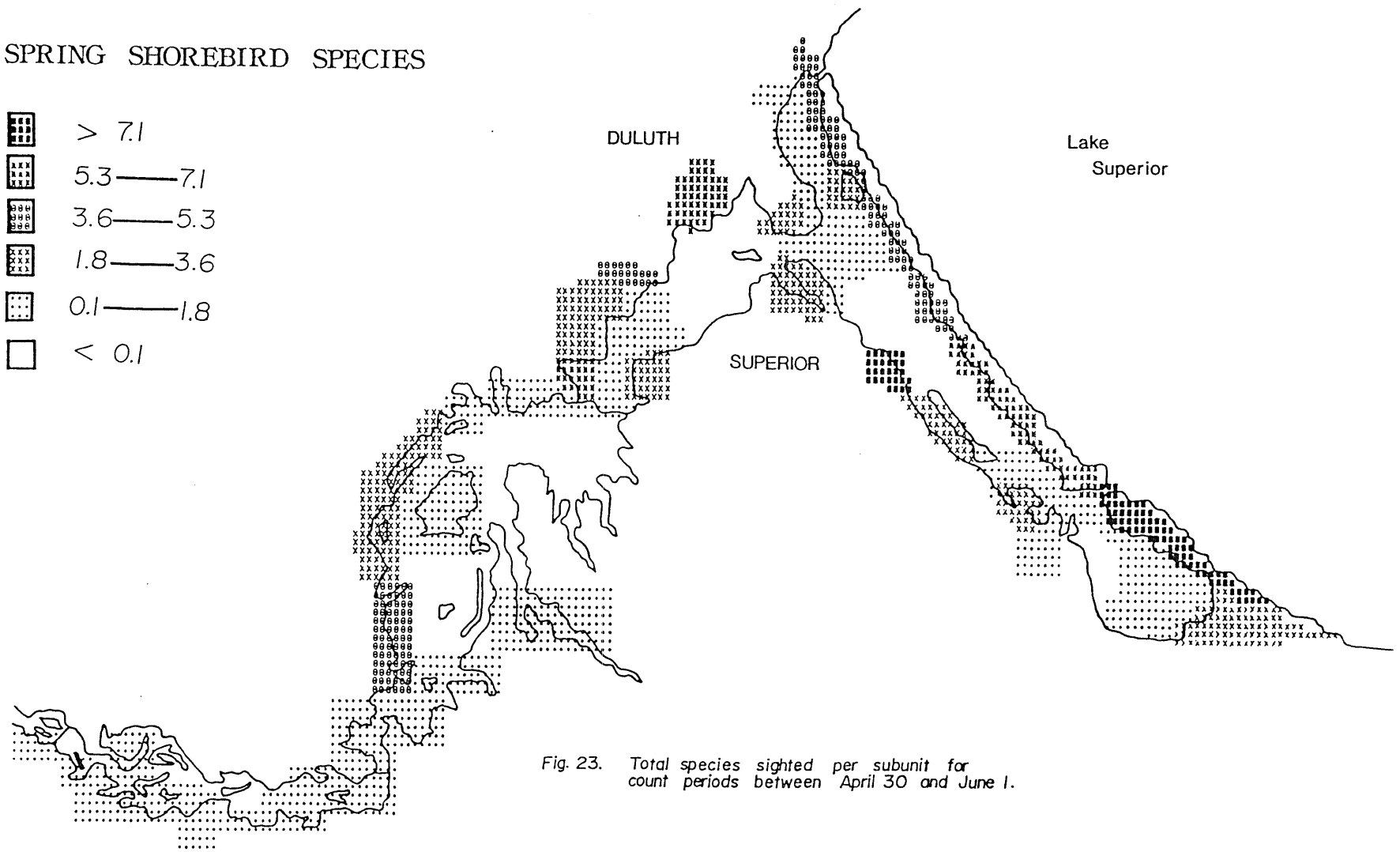


Fig. 23. Total species sighted per subunit for count periods between April 30 and June 1.

ST. LOUIS RIVER ESTUARY

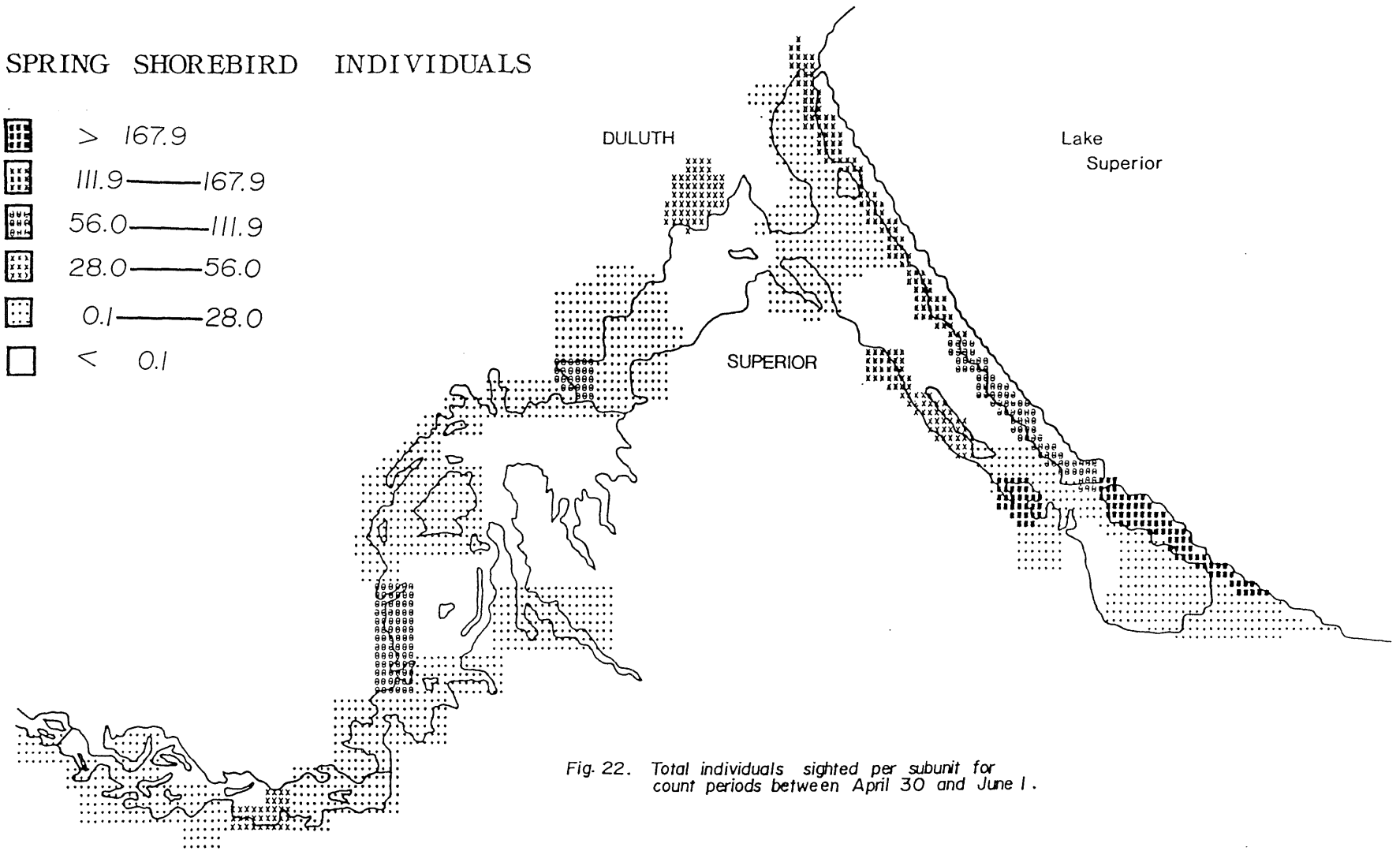


Fig. 22. Total individuals sighted per subunit for count periods between April 30 and June 1.

Table 2. Upland areas sampled during June and July 1999 in the St. Louis River system (Figure 1).

	Allouez Bay #1	Nemadji River #2	Bong Bridge #3	Dwights Pt. & Badger Rd #4	McClures Landing #5	Chases Point #6	Oliver #8	Mont du Lac #9	Fond du Lac #11	Total	Total +
Mallard		2 1+	1+	1+		1+				2	4+
Mourning Dove				1 3+	1 2+					2	5+
Pileated Woodpecker					1+		1			1	1+
Great Crested Flycatcher				1 3+		1+			1	2	4+
Alder Flycatcher	1	1	1			1				4	
Least Flycatcher		1	3	2 2+	2+	3	5 1+	2+	1	15	7+
Eastern Wood Pewee			1	2	4	3			1	11	
Common Crow	1+	3+	1 3+	4+	1+	9+	10+	3+	7+	1	41+
Black-capped Chickadee			3	1 2+	1 2+	1 3+	1 1+	1+	3 1+	10	10+
White-breasted Nuthatch			1+	1	1+	2+	2+	1+	3+	1	10+
Red-breasted Nuthatch			1+	1+	1 1+					1	3+
Brown Creeper				5						5	
House Wren		2		1 1+						3	1+
Winter Wren							3 2+	2 2+		5	4+
Marsh Wren				1						1	
Sedge Wren	2	2								4	
Gray Catbird		1 1+	3 1+	1		1 1+		1		7	3+
American Robin	1	2 1+	3	4 7+	5 1+	2+	4 3+	2	1 1+	22	15+
Wood Thrush					1		1			2	
Hermit Thrush							2 1+		1 2+	3	3+
Veery	1+	1+	5	6 3+	1 2+	13 4+	7 2+	4 1+	6 2+	42	16+
Golden-crowned Kinglet			2	1						3	
Cedar Waxwing		2+	1 1+	3 6+	1 1+	3+	2+		3+	5	18+
European Starling		11								11	
Red-eyed Vireo	1	2	6	18	8	32	19	11 1+	14	111	1+
Warbling Vireo		1 1+	2							3	1+
Black-and-white Warbler	1			4	1	4			2	12	
Nashville Warbler				3 2+	1	5 1+	1		2	12	3+
Yellow Warbler		12	20	2		1		2		37	
Magnolia Warbler				1						1	
Yellow-rumped Warbler			1	2	5		1	1	1	11	
Black-throated Green Warbler			1	6	1 1+	2		1 1+	1	12	2+
Blackburnian Warbler			1	1						2	
Chestnut-sided Warbler		2	2	2 1+		8 1+	1		5	20	2+
Ovenbird	2		4	6	5	8	15	8 1+	9	57	1+
Mourning Warbler				3	2	4	2		3	14	
Common Yellowthroat	6	5	7	17 1+	4	28	7 1+	4	2	80	2+
American Redstart	2	1	2	5	1	10	19	1	9	50	
Red-winged Blackbird		6 1+	5 1+	1+		1 1+	1+			12	5+
Baltimore Oriole						1				1	
Common Grackle		3+		1+			1+		2+		7+
Brown-headed Cowbird		1	4							5	
Rose-breasted Grosbeak				1 1+	1	2	1			5	1+
Purple Finch				1						1	
American Goldfinch		3	2+	2+	1+	2+	1+		4+	3	12+
Vesper Sparrow				1						1	
Chipping Sparrow		1	2			2			1	6	
Clay-colored Sparrow			6	1						7	
White-throated Sparrow	2		3	24	7	19	6 1+	2+	1 1+	62	4+
Swamp Sparrow	3	6		2			1	1		13	

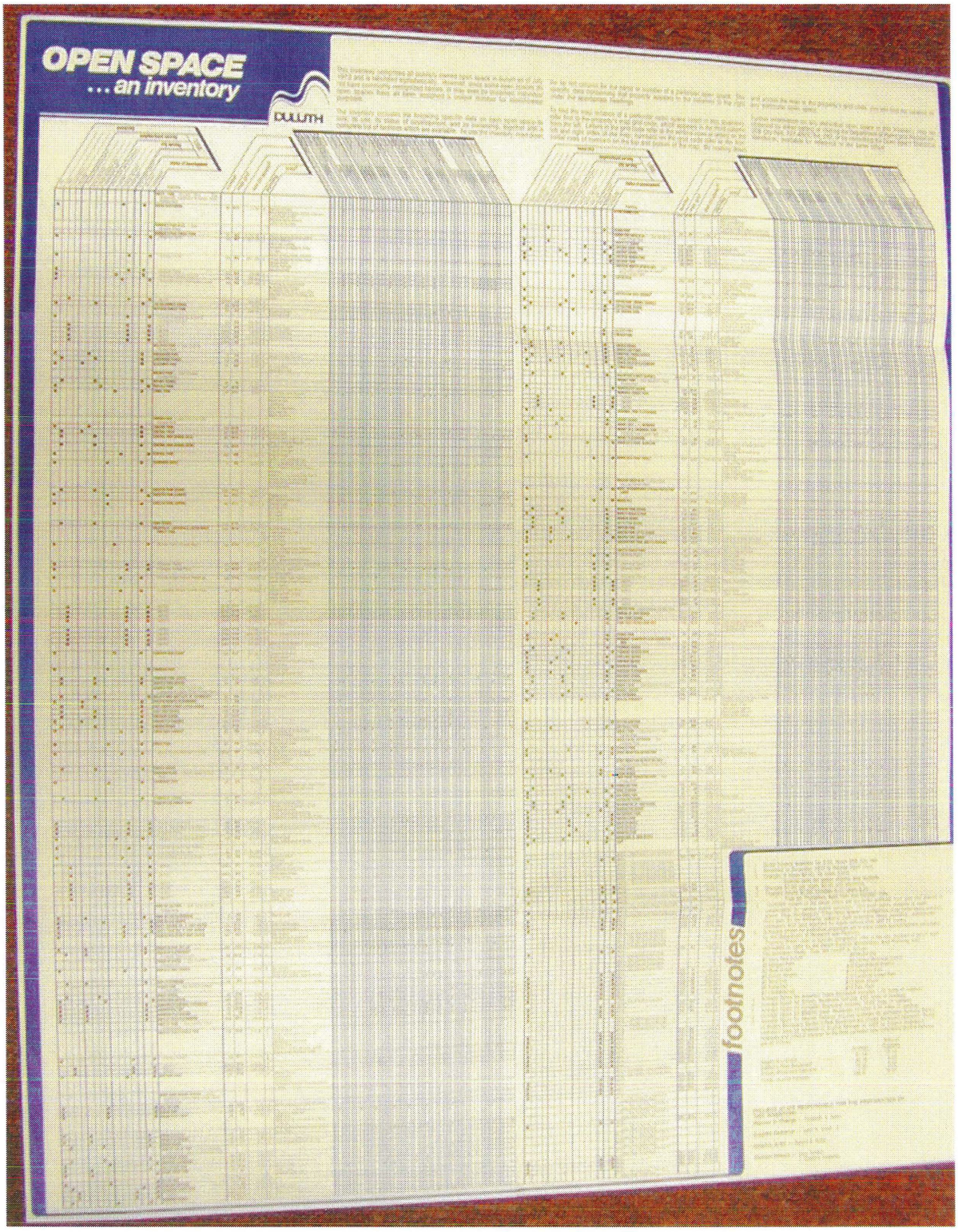
npled during June and July 1999 in the St. Louis River system (Figure 1).

SE buez Bay #2	Southern Allouez Bay #3	Nemadji River #5	So. Hog Island #6	40th Avenue West #8	Grassy Point #9	Hallet Dock #10	Dwights Point #11	NE Indian Point #12	Indian Point Island #13	Pokegama Bay #14	Pokegama Bay #15	No Clough Island #16	No Tallas Island #17	So Tallas Island #18	Smithville Island #19	SW Clough Island #20	Morgan Park Mudflats #22	Kilchliss Meadow #23	Spirit Lake Point #24
										1									
													1						
												1							
		+											+	1					
+		+												+			2		
	2	1		2				1			2								
						2	2	3											
				4	1		1		1		3								
						2													
		3	1	2		4								3					
											+								3
	1		+				1												
													+				1		
								+		+	+		+	+	1				
							+	+				+		+	+	+			+
			+	2		2		1											
+	1	2	1	1	2	1	1	2	2	1	+	1	+	2	1	+	2	1	
											+							+	
+	1	2	1	1	1	1	1	2	2	1	+	1	+	1	2	1	1	1	2
										+				2				1	
1	2	1	+	1	2	1	3	3	+	2	+	3	1	1		3	4		2
	+					+		+	7	+		+		+					
			+	+				+	1				1	2					
3	3	2	3	1	2	1	1	1	4	3	1	1			2	3	3		1
+	1	+	+	3	2	2	1	1	1	1		+	2	+	1		1	1	+
																	2	2	

E South Spirit Lake #27	North Mud Lake #28	South Spirit Lake #29	South Mud Lake #30	So. Oliver Bridge #31	Bear Is. #32	Radio Station #33	Boy Scout Landing Marsh #34	Overlook Marsh #35	South Horseshoe Island #36	North Horseshoe Islalnd #37	No Name Marsh #38	Fond du Lac Marsh #39	East South Spirit Lake #40	North Oliver Bridge #41	Total
															1
1	2														4
1															1
															1
				+										+	2
	1		1				2								12
								4	7			2			20
							1								11
															2
												3			16
					2	4									6
3	2	3		2									3		16
	1		1	2			2					1		1	10
			1		+	1									3
					+	+									1
	+		1		+			1	+	+	+				2
						2									7
	1		2		2	2	1	2	+			1		1	33
					+						+				1
											1	+			3
4	1	1		1	2	1	3	1	2		2	1	+	2	47
	+		1					1	1		1				7
3	4	1	2		2	1	2	2	3	3	1	1		+	63
			+											+	7
															4
4	1		4	3	2	3	2	3	2	1	2	2	2	3	74
	+	5	1	2	1	2		2	2	+	1	3		1	39
										2	1				7

1973 open space map

back side '73 open space map



complete list of facilities which are available. To the inventory

| ownership: City | ownership: State | ownership: School District | ownership: City-State | USE: neighborhood serving: playground/play field (active) | USE: neighborhood serving: park (passive) | USE: neighborhood serving: school recreation area | USE: neighborhood serving: undeveloped area | USE: city serving: large city park (general purpose) | USE: city serving: parkway | USE: city serving: special use area | USE: city serving: forest park | USE: other open spaces: developed | USE: other open spaces: undeveloped | name | number | map grid | size (in acres)[b] | planning area[c] | Bandstand/Stage | Bandhouse | Benches | Boat Launching Ramp/Mooring Slips | Camping | Clubhouse | Concession stand | Courts, Hardsurface | Drinking Water | Fields | Fireplaces/Grates | Golf Course | Horseshoe Pit | Shelter | Lighting | Marina | Memorial Marker/Monument | Parking Lot | Picnic Table | Playground Equipment | Picnic | Pre-School Play Area | Shelter | Skiing | Toilet Facilities | Trails | Supervision Provided | Lifeguarding | Other Figures | Overnight | Golf | Community | Shuffleboard | Volleyball | Basketball | Softball | Baseball | Hockey | Skating | Recreation Room | Soccer | Swimming | Wading | Other | Wading | Diving | Cross Country | Non-Motorized | Motorized | Summer | Winter | Year-round |
|---|---|---

footnotes

1 Guide booklet available for $.50, Room 208, City Hall
2 Renamed in December 1973 to Hillside Sport Court
3 Charges 9 holes $2.00, 18 holes $3.00
Special rates for senior citizens and students
4 Charges $2.00 per night, $2.50 with electricity
5 Charges Adults $1.00, Children 6-12 years $.25
Free on Thursdays, April 15th thru October 15th

a "Includes certain of the lands which are tax forfeit withheld from sale and placed in conservation for various public purposes. One such public purpose is open space. Thus, the category "Other Open Space" is comprised of tax forfeit lands withheld from sale for the following reasons: park extension, forest extension, watercourse protection, and land reserved for future school sites and TV towers."

b Acreages shown for individual properties are in some cases approximations calculated by the Department of Research and Planning.

c "Planning Areas" refer to specific geographic units of the city, fourteen of which were delineated in 1964 by the Duluth-Superior Metropolitan Area Planning and Transportation Study. They are named as follows:

#1 Gary-New Duluth	#8 Model City
#2 Morgan Park	#9 Central Business District
#3 West Duluth	#10 East Hillside-Endion
#4 Duluth Heights	#11 Congdon Park
#5 West End	#12 Lakeside-Lester Park
#6 Kenwood	#13 North Shore
#7 Chesterwood	#14 Park Point

d Acreage figure for Knowlton Creek Boulevard includes 1.70 miles of roadway.

e Acreage figure for Snively Boulevard includes 4.60 miles of roadway.

f Acreage figure for Congdon Boulevard includes 16.00 miles of roadway.

g Acreage figure for Mission Creek Boulevard includes 2.30 miles of roadway.

h Acreage figure for Skyline Parkway includes acreages for parkways formerly known as Rogers Boulevard, Bardon's Peak Boulevard and Snively Boulevard Extension. These parkways were all renamed to Skyline Parkway in 1959 by Council Ordinance. Acreages and miles of roadway for the three parkways now comprising Skyline Parkway are as follows:

	Acreage	Miles of Roadway
Rogers Boulevard	81.74	11.10
Bardon's Peak Boulevard	45.18	6.50
Snively Boulevard Extension	70.00	2.00
TOTAL: Skyline Parkway	196.92	19.60

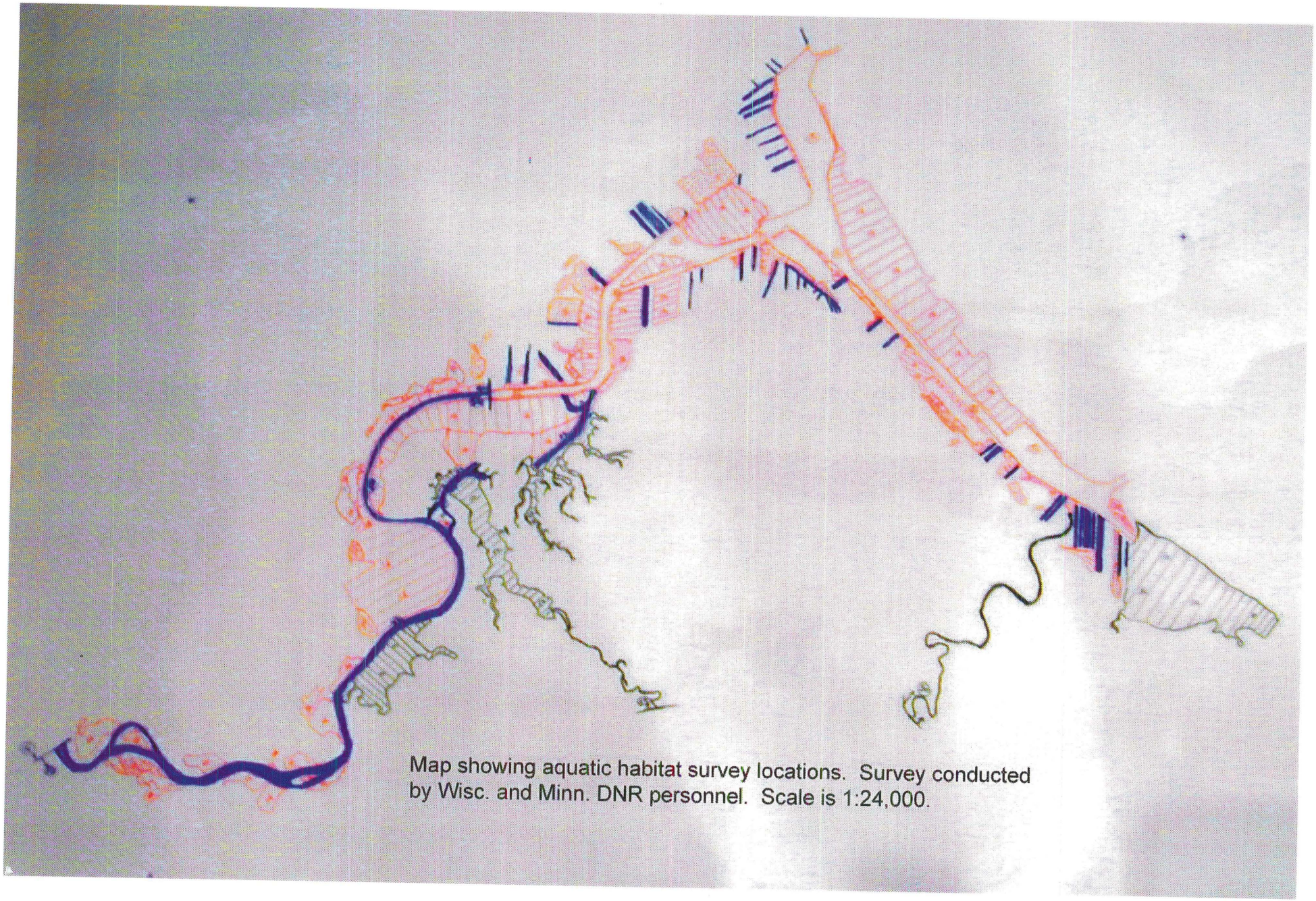
PROJECT STAFF RESPONSIBLE FOR THE PREPARATION OF THIS INVENTORY

Planner in Charge — Elizabeth A. Niemi

Graphic Designer — John R. Ulven, Jr.

Graphic Artist — Barbra E. Kobe

Student Interns — Gary Tonkin
J. Sanders Sweeney



Map showing aquatic habitat survey locations. Survey conducted by Wisc. and Minn. DNR personnel. Scale is 1:24,000.

DNR St. Louis River Estuary Fish Sampling Data

Karen:

Sorry for the delay. Very busy you know. If you have any questions, feel free to contact Dennis or myself. Send us a version/draft of the map so we can share it with the interested parties in our office and at regional headquarters. We can also check it for errors.

Later,

John Lindgren MN DNR

Dennis Pratt WT

files:

Cacrat 5a.wb3
Cacrat 5b.wb3
Cacrat 5c.wb3
Cacrat 5d.wb3
Cacrat 5e.wb3
Cacrat 5f.wb3
Cacrat 5g.wb3
Cacrat 5h.wb3
Wettypes.wpd

Wetland type 5a: Rapids from below Nekuk Island to Fond du Lac Dam (clear)

			SPAWNING				NURSERY				ADULT			
COMMON NAME	Native ?	ABUNDANCE	SPR	SUM	FAL	WIN	SPR	SUM	FAL	WIN	SPR	SUM	FAL	WIN
Black crappie	Y	common	Y					Y				Y		
Burbot	Y	present				Y	Y			Y				Y
Channel catfish	Y	common		Y				Y	Y		Y	Y	Y	Y
Emerald shiner	Y	common						Y	Y			Y	Y	
Lake sturgeon	Y	common	Y				Y	Y	Y	Y	Y			
Longnose dace	Y	present		Y			Y	Y	Y	Y	Y	Y	Y	Y
Longnose sucker	Y	present	Y				Y				Y			
Muskellunge	Y	present	Y					Y	Y		Y	Y	Y	
Northern Pike	Y	common	Y					Y	Y		Y	Y	Y	
Rockbass	Y	common		Y			Y	Y	Y	Y	Y	Y	Y	Y
Shorthead redhorse	Y	common	Y					Y	Y		Y	Y	Y	
Silver lamprey	Y	trace						Y	Y					
Silver redhorse	Y	common	Y									Y	Y	
Slimy sculpin	Y	present		Y				Y	Y	Y	Y	Y	Y	Y
Smallmouth bass	Y	common	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y
Spottail shiner	Y	common						Y	Y			Y	Y	
Stonecat	Y	present		Y				Y	Y		Y	Y	Y	Y
Trout perch	Y	common										Y	Y	
Walleye	Y	common	Y				Y	Y	Y	Y	Y	Y	Y	Y
White sucker	Y	common	Y				Y	Y	Y	Y	Y	Y	Y	Y
Yellow perch	Y	common	Y					Y	Y		Y	Y	Y	Y
American eel	N	trace					Y	Y	Y					
Eurasian ruffe	N	common	Y				Y	Y	Y	Y	Y	Y	Y	Y
Freshwater drum	N	present						Y						
Rainbow smelt	N	present	Y								Y			
Sea lamprey	N	present	Y	Y							Y	Y		

Wetland Type 5c: Active dredged channel from Stryker Bay to Superior Entry (red outline)

			SPAWNING				NURSERY				ADULT			
COMMON NAME	Native ?	ABUNDANCE	SPR	SUM	FAL	WIN	SPR	SUM	FAL	WIN	SPR	SUM	FAL	WIN
Black bullhead	Y	present					Y	Y	Y	Y	Y	Y	Y	Y
Black crappie	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Burbot	Y	present					Y	Y	Y	Y	Y			Y
Channel catfish	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Emerald shiner	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Johnny darter	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Lake herring	Y	trace									Y			
Lake sturgeon	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Lake trout	Y	trace									Y			
Lake whitefish	Y	trace									Y			
Logperch	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Longnose sucker	Y	present					Y				Y	Y		
Muskellunge	Y	present					Y	Y	Y	Y	Y	Y	Y	Y
Ninespine stickleback	Y	trace									Y			
Northern Pike	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Round whitefish	Y	trace									Y			
Shorthead redhorse	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Silver redhorse	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Slimy sculpin	Y	present					Y	Y	Y	Y	Y	Y	Y	Y
Spoonhead sculpin	Y	trace					Y	Y	Y	Y	Y	Y	Y	Y
Spottail shiner	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Tadpole madtom	Y	present					Y	Y	Y	Y	Y	Y	Y	Y
Trout perch	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Walleye	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
White sucker	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Yellow bullhead	Y	trace					Y	Y	Y	Y	Y	Y	Y	Y
Yellow perch	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Atlantic salmon	N	trace									Y			
Chinook salmon	N	trace									Y			
Coho salmon	N	trace									Y			
Eurasian ruffe	N	common					Y	Y	Y	Y	Y	Y	Y	Y
Pink salmon	N	trace									Y			
Rainbow smelt	N	present					Y	Y	Y	Y	Y			
Rainbow trout	N	trace									Y			
Round goby	N	present					Y	Y	Y	Y	Y	Y	Y	Y
Sea lamprey	N	present									Y			
White perch	N	present					Y	Y	Y	Y	Y	Y	Y	Y

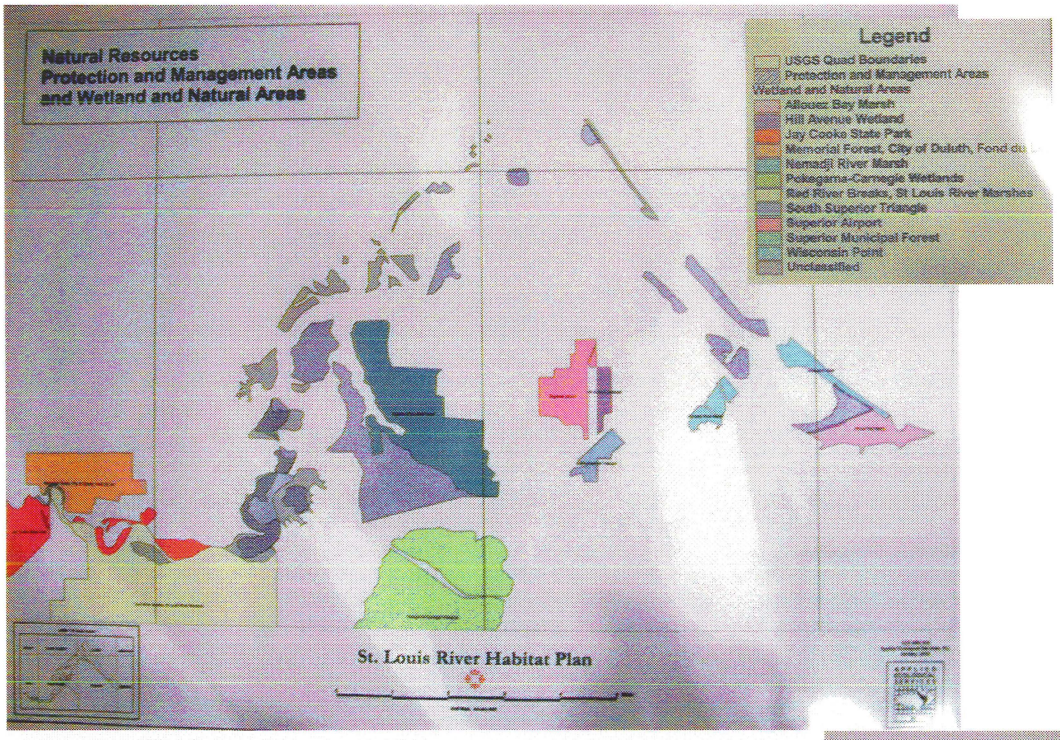
Wetland type 5e: Sheltered bays below Oliver Bridge that are influenced by red clay (black stripe)

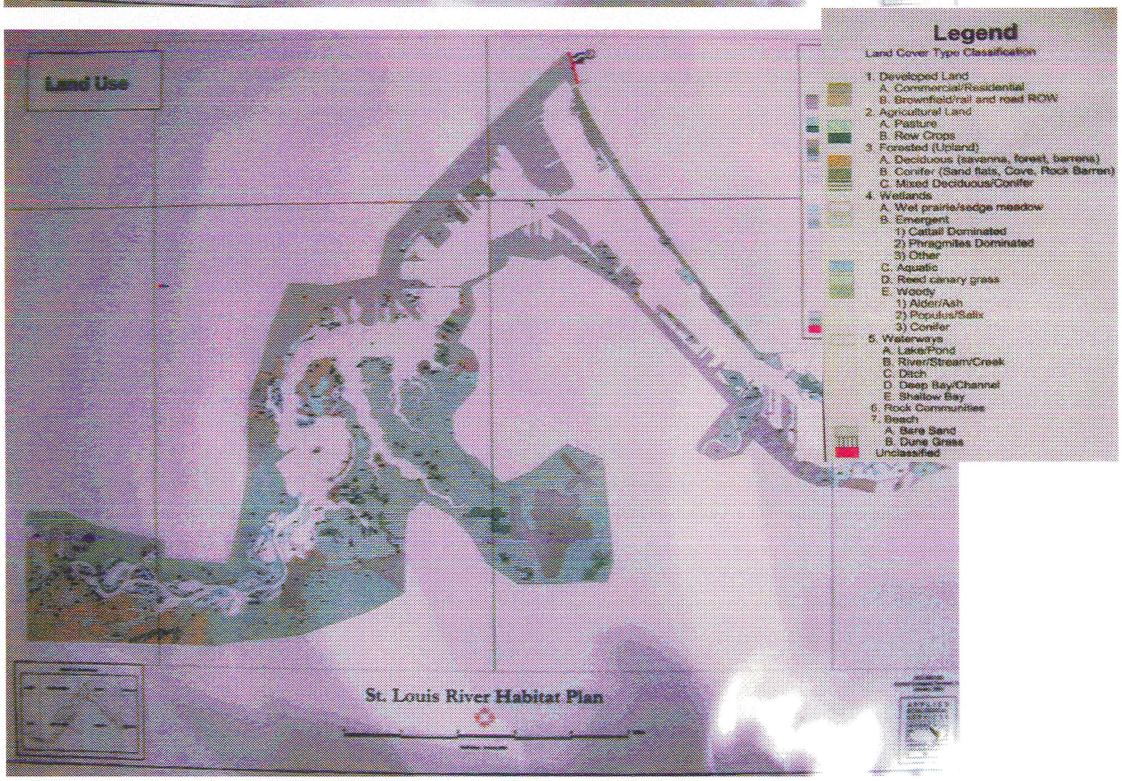
			SPAWNING				NURSERY				ADULT			
COMMON NAME	Native ?	ABUNDANCE	SPR	SUM	FAL	WIN	SPR	SUM	FAL	WIN	SPR	SUM	FAL	WIN
Black bullhead	Y	present		Y			Y	Y	Y	Y	Y	Y	Y	Y
Black crappie	Y	common	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y
Bluegill	Y	present		Y			Y	Y	Y	Y	Y	Y	Y	Y
Brown bullhead	Y	present		Y			Y	Y	Y	Y	Y	Y	Y	Y
Burbot	Y	present					Y	Y	Y	Y	Y			Y
Channel catfish	Y	common	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y
Common shiner	Y	present		Y			Y	Y	Y	Y	Y	Y	Y	Y
Emerald shiner	Y	common		Y			Y	Y	Y	Y	Y	Y	Y	Y
Fathead minnow	Y	present		Y			Y	Y	Y	Y	Y	Y	Y	Y
Golden shiner	Y	present		Y			Y	Y	Y	Y	Y	Y	Y	Y
Johnny darter	Y	common	Y				Y	Y	Y	Y	Y	Y	Y	Y
Lake chub	Y	trace	Y	Y			Y	Y						
Lake sturgeon	Y	common					Y	Y	Y	Y				
Largemouth bass	Y	trace		Y			Y	Y	Y	Y	Y	Y	Y	Y
Logperch	Y	common	Y				Y	Y	Y	Y	Y	Y	Y	Y
Longnose sucker	Y	present					Y	Y			Y			
Mimic shiner	Y	present					Y	Y	Y	Y	Y	Y	Y	Y
Muskellunge	Y	present	Y				Y	Y	Y	Y	Y	Y	Y	Y
Northern Pike	Y	common	Y				Y	Y	Y	Y	Y	Y	Y	Y
Pumpkinseed	Y	trace		Y			Y	Y	Y	Y	Y	Y	Y	Y
Rockbass	Y	common		Y			Y	Y	Y	Y	Y	Y	Y	Y
Shorthead redhorse	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Silver redhorse	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Smallmouth bass	Y	common	Y				Y	Y	Y	Y	Y	Y	Y	Y
Spottail shiner	Y	common		Y			Y	Y	Y	Y	Y	Y	Y	Y
Tadpole madtom	Y	present		Y			Y	Y	Y	Y	Y	Y	Y	Y
Trout perch	Y	common		Y			Y	Y	Y	Y	Y	Y	Y	Y
Walleye	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
White sucker	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Yellow bullhead	Y	trace		Y			Y	Y	Y	Y	Y	Y	Y	Y
Yellow perch	Y	common	Y				Y	Y	Y	Y	Y	Y	Y	Y
Alewife	N	trace	Y				Y	Y	Y	Y	Y	Y	Y	Y
American eel	N	trace					Y	Y	Y	Y				
Carp	N	present		Y			Y	Y	Y	Y	Y	Y	Y	Y
Eurasian ruffe	N	common	Y				Y	Y	Y	Y	Y	Y	Y	Y
Freshwater drum	N	present	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y
Rainbow smelt	N	present	Y				Y	Y	Y	Y	Y			
Rainbow trout	N	trace									Y			
Round goby	N	present		Y			Y	Y	Y	Y	Y	Y	Y	Y
Threespine stickleback	N	present					Y	Y	Y	Y	Y	Y	Y	Y
White bass	N	trace		Y			Y	Y	Y	Y	Y	Y	Y	Y
White perch	N	present		Y			Y	Y	Y	Y	Y	Y	Y	Y

Wetland type 5g: Industrially influenced slips (solid blue)

			SPAWNING				NURSERY				ADULT			
COMMON NAME	Native ?	ABUNDANCE	SPR	SUM	FAL	WIN	SPR	SUM	FAL	WIN	SPR	SUM	FAL	WIN
Black bullhead	Y	present									Y	Y	Y	Y
Black crappie	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Brown bullhead	Y	present					Y	Y	Y	Y	Y	Y	Y	Y
Burbot	Y	present									Y			Y
Channel catfish	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Emerald shiner	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Johnny darter	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Lake sturgeon	Y	common					Y	Y	Y	Y				
Logperch	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Muskellunge	Y	present					Y	Y	Y	Y	Y	Y	Y	Y
Northern Pike	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Shorthead redhorse	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Silver redhorse	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Slimy sculpin	Y	present					Y	Y	Y	Y	Y	Y	Y	Y
Spoonhead sculpin	Y	trace					Y	Y	Y	Y	Y	Y	Y	Y
Spottail shiner	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Trout perch	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Walleye	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
White sucker	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Yellow bullhead	Y	trace					Y	Y	Y	Y	Y	Y	Y	Y
Yellow perch	Y	common					Y	Y	Y	Y	Y	Y	Y	Y
Eurasian ruffe	N	common					Y	Y	Y	Y	Y	Y	Y	Y
Rainbow smelt	N	present					Y	Y	Y	Y				
White perch	N	present					Y	Y	Y	Y	Y	Y	Y	Y

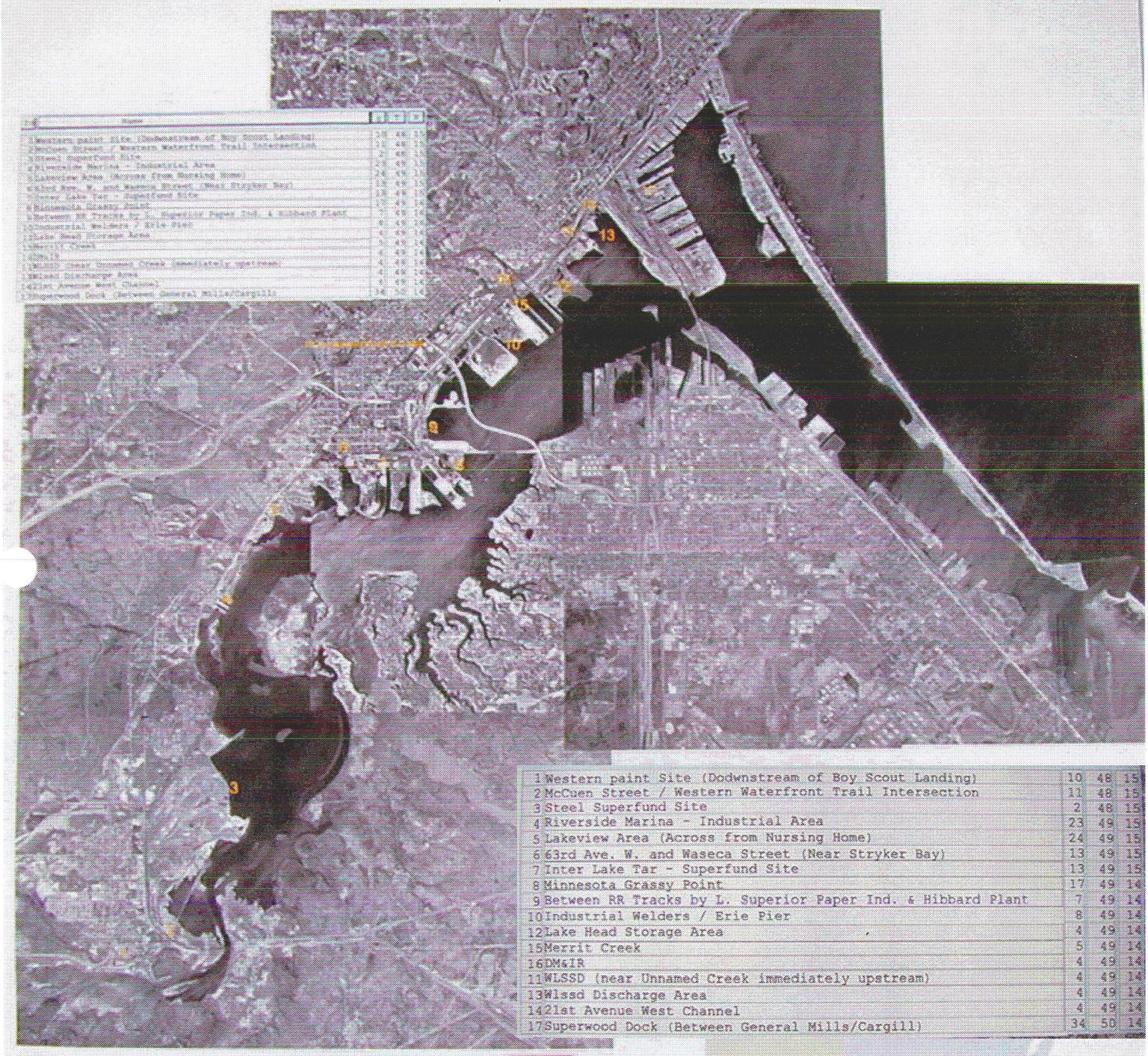
ST. LOUIS RIVER ECOL.
HABITAT SURVEY





Data and maps currently under production by contractor for St. Louis River estuary project - map scale is 1:24,000.

Coastal Services Center Project



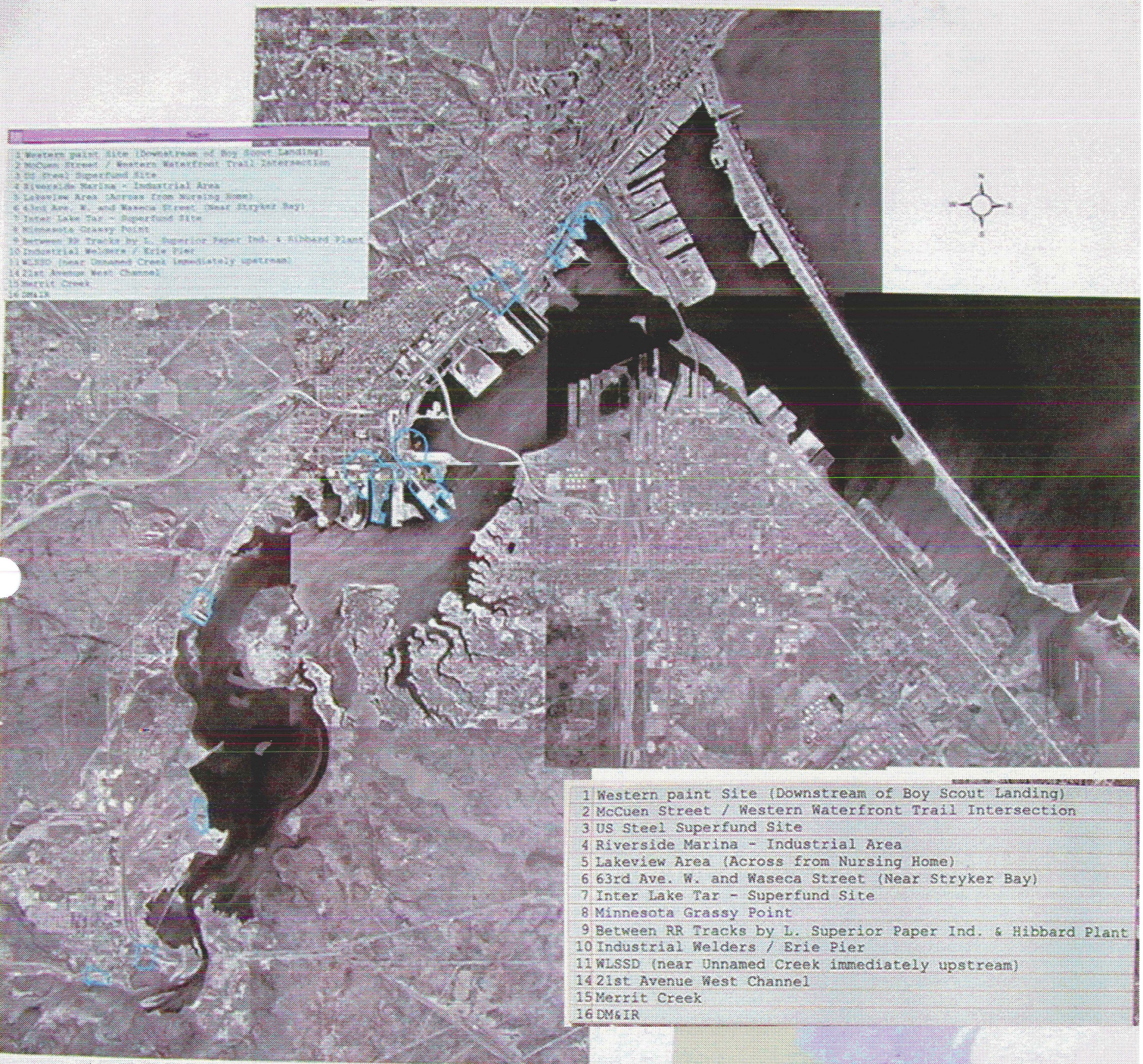
1 Western paint Site (Dodwnstream of Boy Scout Landing)	10	48	15
2 McCuen Street / Western Waterfront Trail Intersection	11	48	15
3 Steel Superfund Site	2	48	15
4 Riverside Marina - Industrial Area	23	49	15
5 Lakeview Area (Across from Nursing Home)	24	49	15
6 63rd Ave. W. and Waseca Street (Near Stryker Bay)	13	49	15
7 Inter Lake Tar - Superfund Site	13	49	15
8 Minnesota Grassy Point	17	49	14
9 Between RR Tracks by L. Superior Paper Ind. & Hibbard Plant	7	49	14
10 Industrial Welders / Erie Pier	8	49	14
12 Lake Head Storage Area	4	49	14
15 Merrit Creek	5	49	14
16 DM&IR	4	49	14
11 WLSSD (near Unnamed Creek immediately upstream)	4	49	14
13 Wlssd Discharge Area	4	49	14
14 21st Avenue West Channel	4	49	14
17 Superwood Dock (Between General Mills/Cargill)	34	50	14

Scale 1:24 000

A Cooperative Project between the Minnesota Department of Natural Resources

Coastal Services Center Project

potential wetland mitigation sites



1	Western paint Site (Downstream of Boy Scout Landing)
2	McCuen Street / Western Waterfront Trail Intersection
3	US Steel Superfund Site
4	Riverside Marina - Industrial Area
5	Lakeview Area (Across from Nursing Home)
6	63rd Ave. W. and Waseca Street (Near Stryker Bay)
7	Inter Lake Tar - Superfund Site
8	Minnesota Grassy Point
9	Between RR Tracks by L. Superior Paper Ind. & Hibbard Plant
10	Industrial Welders / Erie Pier
11	WLSSD (near Unnamed Creek immediately upstream)
14	21st Avenue West Channel
15	Merrit Creek
16	DM&IR

Scale 1:24 000

A cooperative project between the Minnesota Department of Natural Resources and Arrowhead Regional Development Commission

Minnesota Land Management Information Center Metadata Directory

Metadata Summary

Minnesota State Historic Preservation Office (SHPO) Archaeological Inventory Database

Originator State Historic Preservation Office (SHPO) - Minnesota Historical Society

Abstract The SHPO Archaeological database consists of archaeological properties identified and inventoried by the SHPO, Office of the State Archaeologist, cooperating state and federal agencies, and professional archaeologists in the course of their archaeological research activities. For the past 30 years these activities have been carried out through provisions of the National Historic Preservation Act, the Minnesota Historic Sites Act, and the Minnesota Field Archaeology Act.

Time Period of Content Date 1998

Currentness Reference Late 19th century to present. Date of most recent fieldwork.

Access Constraints The database is available at no charge to federal and state agency cultural resource managers. Local units of government, historic preservation consultants, and professional archaeologists can obtain information for project specific purposes. Others seeking access to the information contained in the database must obtain written permission from the State Archaeologist or the Deputy State Historic Preservation Officer. Data is available in .dbf IBM compatible format.

Use Constraints Database is continually being edited so files quickly become out of date.

Browse Graphic File Name none available

Distributor Contact Person Scott Anfinson

Distributor Organization State Historic Preservation Office (SHPO) - Minnesota Historical Society

Distributor Voice Phone 651-296-5434

Ordering Instructions Contact Distributor

Online Linkage none available

Full Metadata Record

These metadata were created using the Minnesota Geographic Metadata Guidelines .

Go to Section:

1. Identification Information
2. Data Quality Information
3. Spatial Data Organization Information
4. Spatial Reference Information
5. Entity and Attribute Information
6. Distribution Information
7. Metadata Reference Information

Section 1 Identification Information

Originator State Historic Preservation Office (SHPO) - Minnesota Historical Society

Title	Minnesota State Historic Preservation Office (SHPO) Archaeological Inventory Database
Abstract	The SHPO Archaeological database consists of archaeological properties identified and inventoried by the SHPO, Office of the State Archaeologist, cooperating state and federal agencies, and professional archaeologists in the course of their archaeological research activities. For the past 30 years these activities have been carried out through provisions of the National Historic Preservation Act, the Minnesota Historic Sites Act, and the Minnesota Field Archaeology Act.
Purpose	Create an inventory of known and suspected archaeological properties throughout the state; identify and determine eligibility of archaeological properties to the National Register of Historic Places.
Time Period of Content Date	1998
Currentness Reference	Late 19th century to present. Date of most recent fieldwork.
Progress	In work
Maintenance and Update Frequency	Annually
Spatial Extent of Data	Minnesota
Bounding Coordinates	-97.25 -89.48 49.40 43.50
Place Keywords	Minnesota
Theme Keywords	Archaeology, Archaeological Site, Prehistoric Archaeology, Historic Archaeology, National Register of Historic Places
Theme Keyword Thesaurus	None
Access Constraints	The database is available at no charge to federal and state agency cultural resource managers. Local units of government, historic preservation consultants, and professional archaeologists can obtain information for project specific purposes. Others seeking access to the information contained in the database must obtain written permission from the State Archaeologist or the Deputy State Historic Preservation Officer. Data is available in .dbf IBM compatible format.
Use Constraints	Database is continually being edited so files quickly become out of date.
Contact Person Information	Scott Anfinson, Archaeologist State Historic Preservation Office (SHPO) - Minnesota Historical Society 345 Kellogg Blvd. W. St. Paul, MN 55102 Phone: 651-296-5434 FAX: 651-282-2374 E-mail: scott.anfinson@mnhs.org
Browse Graphic File Name	none available

Browse Graphic File Description	Not applicable
Associated Data Sets	The SHPO Architecture-History Database This database consists of architectural and historic properties (buildings, structures, objects, districts, and landscapes) identified and inventoried by the SHPO, state and federal agencies, and local units of government in the course of their historic preservation activities.

Section 2 Data Quality Information - - - - - - Go back to top

Attribute Accuracy	Data was collected by field crews. Attribute accuracy varies widely. Paper records sometimes list source of information.
Logical Consistency	Not applicable
Completeness	Archaeological properties from the Chippewa and Superior National Forest are not present in the database. Access to Forest Service information can be obtained by contacting the Chippewa or Superior National Forest.
Horizontal Positional Accuracy	Data was collected in the field and plotted on a variety of base maps. Archaeological properties visited in the past 30 years are located on USGS maps. Almost all site locations are accurate to the quarter section. Most site locations are accurate to within a quarter-quarter section. Site boundaries are poorly defined, as are site centroids. Database contains as assessment as to the accuracy of the property's location.
Vertical Positional Accuracy	Not applicable
Lineage	Paper records are from the Office of the State Archaeologist, SHPO Statewide Survey, MHS Archaeology Department, and archaeological research reports in the SHPO. Database is maintained at irregular intervals. Records are edited on an ongoing basis. New properties are added to the database on at least a yearly basis.
Source Scale Denominator	24000

Section 3 Spatial Data Organization Information - - - - - - Go back to top

Native Data Set Environment	Windows NT network, Visual dBASE 5.5, arch.dbf
Geographic Reference for Tabular Data	None
Spatial Object Type	Point
Vendor Specific Object Types	Not applicable
Tiling Scheme	None

Section 4 Spatial Reference Information - - - - - - Go back to top

Horizontal Coordinate Scheme	UTM
Ellipsoid	Clarke 1866
Horizontal Datum	NAD27
Horizontal Units	Meters
Distance Resolution	Unknown
Altitude Datum	Not applicable
Altitude Units	Not applicable
Depth Datum	Not applicable
Depth Units	Not applicable
UTM Zone Number	14, 15, 16
Coordinate Offsets or Adjustments	None

Section 5 Entity and Attribute Information - - - - - - Go back to top

Entity and Attribute Overview

The SHPO Archaeological database has a simple variable-attribute structure. Each record corresponds to an individual property. For properties located in multiple sections, the property record is repeated for each section; the UTM is placed in the first record and represents the property's approximate centroid. The record number for multiple entries are identified in the SITENAME with a (1), (2) etc. The database contains site location information, archaeological research data, and historic preservation management information.

COUNTY - name of the county
SITENUM - Smithsonian Institution's trinomial designation currently assigned by Office of the State Archaeologist
SITENAME - can be designated by the archaeologist responsible for its identification
FIRSTDATE - the year the site was initially recorded
DATESURVEY - last date of fieldwork by a professional archaeologist
FIELDNUM - field number(s) assigned by archaeologists
CITYTWP - name of the minor civil subdivision
REGION - SHPO archaeological research region
USGS - USGS map where the site is located
TOWNSHIP - township number
RANGE - range number
EASTWEST - east or west ranges
SECTION - section number
XQUARTERS - quarter-quarter-quarter section where the property is located
QTRQTRQTR - 10 acre cell
QTRQTR - 40 acre cell
QTR - 160 acre cell
DATUM - NAD27

UTMZONE - UTM zone
EASTING - UTM easting coordinate using NAD27
NORTHING - UTM northing coordinate using NAD27
ACRES - number of acres associated with the property
LOCCONF - confidence of locating property on USGS map
DESCRIPT - site type as defined in SHPO historic context documents
FUNCTION - site function as defined in SHPO historic context documents
MOUNDS - number of earthworks reported at the site
DISTURB - refers to the degree of site disturbance
PERIOD - general temporal period of the site as defined in SHPO historic contexts
TRADITION - archaeological tradition as defined in SHPO historic context documents
CONTEXT - archaeological culture as defined in SHPO historic context documents
DATEMETHOD - method used to date the site
CERAMIC - known ceramic types recovered from the site
LITHIC - known stone tool types recovered from the site
BIOLOGICAL - known human, faunal, and floral remains recovered from the site
OTHER - other archaeological materials recovered from the site
EXOTIC - exotic raw materials recovered from the site
DRAINAGE - location of site within a major drainage basin
SETTING - general landscape setting of the site
OWNERTYPE - owner of the site if known
WORKTYPE - refers to the level of archeological investigation
REPOSITORY - location of the site's collection if known
ACCNUMBER - collection accession numbers if known
REPORTS - most recent research reports
REFERENCE - known references in the published literature
CHANGE - changes made to site database that differ from information on site form
NRHP - list on the National Register of Historic Places
CEF- is the property 'considered eligible' for the National Register
DOE - has the property been formally 'determined eligible' for the National Register
BURIALAUTH - burial authentication by state archaeologist
STATEARCH - Office of the State Archaeologist license number
RCNUMBER- Review and Compliance number from a SHPO review
INDATE - date site is added to the database
NOTES - archaeological terminology that denotes temporal or cultural affiliation
XEASTING- UTM for Zone 15 extended as calculated by LMIC
XNORTHING- UTM for ZONE 15 extended as calculated by LMIC

Entity and Attribute Detailed Citation Minnesota SHPO Archaeological Database documentation

Section 6 Distribution Information - - - - - - Go back to top

Publisher State Historic Preservation Office (SHPO) - Minnesota Historical Society

Publication Date Unknown

Contact Person Information	Scott Anfinson, Archaeologist State Historic Preservation Office (SHPO) - Minnesota Historical Society 345 Kellogg Blvd. W. St. Paul, MN 55102 Phone: 651-296-5434 FAX: 651-282-2374 E-mail: scott.anfinson@mnhs.org
Distributor's Data Set Identifier	SHPO Archaeological Inventory
Distribution Liability	Contact Distributor
Transfer Format Name	.dbf
Transfer Format Version Number	
Transfer Size	
Ordering Instructions	Contact Distributor
Online Linkage	none available

Section 7 Metadata Reference Information - - - - - - Go back to top

Metadata Date	11/02/1998
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Metadata Standard Name	Minnesota Geographic Metadata Guidelines
Metadata Standard Version	1.2
Metadata Standard Online Linkage	http://www.lmic.state.mn.us/gc/stds/metadata.htm

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